The Builder.

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The Revival in Holland.

CONTINUING our notice of the revival of architecture in Holland,* we would point to a very large new church at Velemen, about five miles from Bois-le-Duc, and which, from a distance, presents an imposing appearance. Upon a nearer approach, however, one is disappointed, as some of the detail is very poor. The building consists of a lofty nave and aisles, deep transepts, and a choir, with chevet, and five radiating chapels. At the west end is a lofty tower, crowned with a slate spire; and at the intersection is a *flêche*. The tower and spire are well designed, and the apse is picturesque and well arranged; in fact, the whole exterior of the church is striking, and far from bad. Upon entering the building, however, everything good disappears; for arches, triforium, clearstory, and vaulting are all composed of plaster; and, to make the matter worse, all the mouldings, columns, and so on, are most elaborate and intricate, and all the capitals are adorned with foliage, also executed in plaster. The design really would not be so very bad, were it not carried out in plaster; but nothing can excuse or palliate such a detestable sham. The radiating chapels of the apse, which present a good appearance from the exterior, are built off from the choir, and are, we suppose, used as sacristies. The architect of this most disappointing church is Mr. Van Tolda, of Tilburg, who has also built a large church at Tilburg, where all the faults of the one at Velemen are repeated, without any of its merits.

At Helmond, near Eindhoven, is a large new church, very similar in general outline to that at Velemen, only larger, and far better in detail. We were unable to see the interior of this church, or to learn who was its architect. Between Helmond and Bois-le-Duc is Eindhoven, where Mr. Cuypers has built a really magnificent church; and perhaps it is not too much to say that this is the finest modern church in the Netherlands. When seen from a distance, the two lofty spires and the *flêche* of this church present a most dignified appearance, and make this small town look quite like a cathedral city. This fine church consists of a nave of five bays, two lofty western towers, which become octagonal half-way up, and are crowned with slate spires of dissimilar design. The west front, which is simple and grand, is pierced by a large rose-window and three very bold doorways, the centre one of which is double, and has pierced tracery in the head, and a finely-executed statue of the Madonna and Child against the dividing column. The western gable is formed of a combination of niches and open windows. Each side of the nave has five well-proportioned flying buttresses. The transepts are each two bays deep, and the ends have well-designed rose windows, with a single row of lancets below. The choir has three bays and a chevet, from which project three large hexagonal radiating chapels. The whole church is built of brick both within and without, with all the dressings of dark yellow stone. Over the intersection of the nave and transepts is a lofty and very graceful *flêche* of wood covered with lead. The interior of this church is quite as fine, if not finer than the exterior. It is vaulted throughout in different coloured brick, with stone ribs. The clearstory windows consist each of two simple lancets under a sexfoil rose. The triforium is very original and pretty; it consists of three arched openings over each main arch, the upper portions of which are filled with simple perforated tracery, and the lower portions are filled in with a very conventional imitation of drapery similar to that on the exterior of the west front of Rheims Cathedral. The effect of this portion of the church is singularly happy. The main arches of the nave and choir are well proportioned, and the capitals of the columns are everything that can be desired in the way of carving. The internal effect of the chevet, with its three hexagonal chapels, is very fine, as are also the transepts, each of which contains a chapel and altar. The choir fittings are not yet completed, as there are no stalls, though space has been left for them. The high altar is small, but charmingly designed, as are also the metal candlesticks and other furniture attached to it. The side-screens are of stone and marble. At the back of the high altar is a brass plate, stating the date of the commencement of the church (we think it was 1860 or 1862), and its completion in 1868; also giving the name of the architect, Mr. Cuypers, and his able assistant, Mr. Bolsius (to whom we are indebted for much valuable information with regard to the works of Mr. Cuypers, for which we wish to offer him our thanks).* This church, as we are informed by the inscription above referred to, "was erected under the personal superintendence of Mr. Bolsius," who resided on the spot during the whole time the works were in progress. Not the least beautiful part of this church is the decoration; and here, as at St. James's, Bois-le-Duc, Mr. Cuypers has made large use of positive white; for, although the interior of the church is lined with brick of a warmish buff colour, lines of positive white (which is simply whitewash) mark all the more important divisions of the architecture, and are introduced with great effect between the red and yellow bricks of the vaulting and main arches. Along the sides of the church, and over the altars, are sacred subjects painted upon a white ground in a very severe style. Colour is amply used even upon the stonework, and the decorative painting on the high altar and side screens is harmonious. The stained glass is remarkably good; and here we again see the great brilliancy given by the use of a large quantity of white. In the transept windows the figures of the apostles and prophets are all draped in white, the colour, which is rich and deep, being confined to the borders and backgrounds of the windows, the effect is remarkably good. We regret that our space will not allow us to dwell longer on this remarkable and beautiful church, so with a list of the chief dimensions we will close this description of it. The entire length is 237 ft.; width over transepts, 114 ft.; width of nave and aisles, 71½ ft.; height to vaulting of nave, 71½ ft.,—side aisles, 33 ft.; height of spires, 244 ft.

Not far from Eindhoven is another very large and remarkable church, by Mr. Cuypers, at a place called Vechel. In general arrangement it is somewhat similar to Eindhoven, except that it has only one western tower, and at the east end the chevet has two semi-octagonal radiating chapels, and two triangular ones, and a Lady Chapel of two bays, terminating in an apse projecting from the east end. The nave here, also, has one bay more than at Eindhoven. The church is of even larger dimensions than Eindhoven: they are as follow:—Entire length, 245 ft.; width of nave and aisles, 72 ft. (inside); width of nave, 32 ft.; height to vaulting, 72 ft.; height of tower, 268 ft. The whole of this magnificent church is vaulted in stone, and the columns are of granite. The church contains eight altars, and has in addition a baptismal and a mortuary chapel. The lower portion of the western tower forms a finely-vaulted porch.

Mr. Cuypers's church at Breda has already been described and illustrated in this paper. We now give the dimensions of this church, which we were obliged to omit on the former occasion; they are as follow:—Entire length, 216 ft.; width of nave, 27 ft.; height of nave, 66 ft.; height of lantern tower, 235 ft.

We cannot consider this church such a satisfactory building as either of the former ones we have described: though the effect of the double aisles to the nave is undoubtedly good, yet the great open triforium (which is to be used as a gallery) has a bald and weak appearance, and the clearstory wants dignity; in fact, we cannot help thinking it a pity that Mr. Cuypers has sacrificed his design to the idea of utilising the triforium, which can at best make but an unsatisfactory kind of gallery. Some of the details of this church, and the carving of the capitals, are admirable; and there is some very clever decoration and furniture, as well as one or two interesting *old* pictures. In the sacristy is a fine fourteenth-century remonstrance, which, together with the pictures, originally belonged to the cathedral (now Protestant).

The superb monument in the cathedral to the memory of John of Nassau (fifteenth century) has been carefully restored. The rest of the church is in a most disgraceful condition. The nave alone is used by the Calvinists; and the magnificent choir and transepts are allowed to go to ruin, except for the thick coats of whitewash with which they are bedaubed from time to time.

At Oudenbosch a very large new Roman Catholic Church is being built, from the designs of the same architect. It is in the Romanesque style, built entirely of brick. It consists of a nave and aisles, transepts, and a choir, terminating in a semicircular apse.

The following are the principal dimensions:—Length, 260 ft.; height of nave to ceiling, 65 ft.; height of octagonal lantern over crossing, 220 ft.; width of nave, 40 ft.; nave and aisles, 73 ft.

This church is only carried up as high as the walls of the side aisles; but it promises to be a very solid and striking building, though very plain.

At Rotterdam six new churches are building, or have been recently completed; four of these are Roman Catholic and two Protestant (Calvinist).

The Catholic Church of St. Mary, which is being built, or rather rebuilt, by Mr. Cuypers, will be a fine building when finished. The transept alone, however, is at present completed, and, although good, it is not quite equal to other works we have seen by this architect. When completed, this church will be about 180 ft. long, and will have double aisles, a centre lantern, and two western towers.

The Roman Catholic Church of St. Anthony, recently erected from the designs of Mr. J. Margerij, is, on the whole, a good building. It consists of a nave and aisles, transepts, and an apsidal choir, with a sacristy underneath. Over the crossing is a graceful flêche. The church is built of brick, and vaulted throughout in the same material. We suppose that Mr. Margerij was a pupil of Mr. Cuypers, or we should be inclined to accuse him of plagiarism, as this

* See p. 757, *ante*.

* A portrait of Mr. Cuypers is given in our present Number, p. 806.

church bears such a strong family likeness to portions of Eindhoven and Vechel. Its chief faults are, firstly, the thinness of the columns supporting the triforium arcade; secondly, the arrangement of the chancel over the sacristy; thirdly, the chamfering of the piers at the crossing, which would be too thin without such a treatment, and with it presents a terribly weak appearance; and, lastly, the *horrible* stained glass with which the windows are disfigured. However, on the whole, it is a good church, and if, as we suppose, the architect is a young man, it gives hope of better things in future.

Near to this is a small new Protestant church, of which it is perhaps enough to say that it is impossible to conceive anything more mean, or less suited to the purposes of religious worship.

Not far from this another Roman Catholic church is being built, in a street called "Endragts-laan." It is a Romanesque building, of small size, but great pretensions. It is only about 80 ft. long by 40 ft. wide, and yet it has two western towers, a nave, aisles, with triforium gallery over, supported upon columns of black granite; transepts and apsidal chancel. Were there anything like scale to the building, it would not be bad, but as it stands, it is a mere toy or model. The architect is Mr. Laurens. The other Roman Catholic church is attached to the cemetery; it is also Romanesque, and has the same faults, though in a lesser degree, that exist in the former church.

The other Protestant church to which we referred, is situated near the terminus of the Rotterdam and Amsterdam railway, and is far from being a bad building. In plan it is nearly square. Each side shows a gable, with two wings. At one angle is a tower crowned by a slate spire of very fair design. Each side of the building is pierced with a rose-window, and five long semicircular-headed lights. The style chosen is a kind of modified Romanesque.

The Hague has not distinguished itself in architecture within the last few years. A horrible cast-iron spire, of open tracery work, has been added to the tower of the old church, and an equally bad new church has been erected in a street called Blyenberg. The fine fourteenth-century hall belonging to the Parliament House at the Hague has been badly restored. This is much to be regretted, as this Dutch counterpart of our Westminster Hall is a most valuable example of civil architecture of the Middle Ages, and its great hammer-beam roof is quite unique on the Continent.

If, however, the Hague has been behind hand in the revival of Gothic architecture, the same blame cannot be attached to Amsterdam, where several very fair Gothic churches have been erected. In addition to the Redemptorist Church already described, we must notice that of the Immaculate Conception from the designs of Mr. Cuypers. It is a cruciform building. The west front and western bay of the nave are not yet built, but when completed the church will be about 160 ft. long. There is a singular arrangement in the nave, which has a double triforium one above the other, each one being used as a gallery. The effect here is better than at Breda, but we cannot quite reconcile ourselves to these practical triforia. Here, however, there is great excuse for such an arrangement, as ground is excessively valuable, and it is necessary to accommodate as large a congregation as possible on the smallest possible space. The whole church, including the lower triforum, is vaulted in brick.

Another Roman Catholic church has just been commenced, from the designs of the same architect. When completed, this will be the most important modern church in Holland: it is of grand dimensions, the length being upwards of 300 ft., and the width across the transepts over 150 ft. The choir and transepts will be completed at once, and the nave and aisles, towers, &c., carried on as funds are forthcoming.

At Alkmaar, in North Holland, the same architect (Mr. Cuypers) has erected two important Roman Catholic churches. That dedicated to St. Lawrence is a fine cruciform church, 178 ft. long by 92 ft. 6 in. over the transepts. The tower is only as high as the apex of the nave roof at present, but will eventually be carried up another story and crowned with a spire. The roof of the nave here is a wooden barrel-vault. The choir and aisles are vaulted in brick and stone. There is a good deal of very capital decoration.

The church of St. Dominic is a clever, but rather singular building. It is in plan an irregular square, 117 ft. each way. It is cruciform and has double aisles on either side of the nave, and two small supplementary aisles as well. At the intersection is an octagonal lantern.

Very large and important churches are in course of erection by the same architect at Sneek and Klosterburen, in Friesland, and have been recently completed at Vorder, Jabeck (the latter has an open timber hammer-beam roof), Vlaardingen, Offelt, Dockum, Bodegraven, and Blaauwhuis. The last-named is a very remarkable church, with transepts both at the junction of the choir and at the west end. The length is 150 ft., and the whole church is vaulted.

There are very many more works by Mr. Cuypers which are well worthy of notice, but our space will not allow of our describing them, and a mere list would only be tedious and uninteresting.

We think that our readers will agree, after reading this paper, that the revival of Gothic architecture in Holland is really extraordinary. And when it is taken into consideration that all these large and important churches which we have mentioned or described have been erected within the last twenty years, and are spread over a country less than a third the size of England, and with a whole population not much greater than that of London, we have a good idea of the enthusiasm with which this movement has been taken up by our Dutch neighbours. Nor must we forget the large size of many of these churches, six of those we have described are over 200 ft. long, viz., Amsterdam (building) nearly 300 ft.; Oudenbosch (building), 260 ft.; Vechel (completed), 245 ft.; Eindhoven (completed), 237 ft.; Breda (completed), 216 ft.; and Sneek (building), 210 ft.

We are not aware that any country in Europe (except, perhaps, France) can show such a list of large churches now building, or recently completed.

Of course, these important churches cannot be erected without a large outlay, and that is an additional proof of the great prosperity of the Dutch people, and also of their generosity and liberality. We are informed, upon good authority, that when a church is proposed to be built in Holland, nearly every person in the parish puts on one side a certain portion of his income for so many years, which he regularly subscribes to the building fund of the church. Thus, when a church is commenced, those who undertake the work know within a little what sum of money they can safely depend upon getting for its completion.

We wish we could find some words of praise for the way in which most of the *old* churches in Holland are kept, but unfortunately we cannot. The condition of the ancient churches at Breda, Scheidam, Bergen-op-Zoom, and many others we could name, is a national disgrace. The naves of these buildings alone are used by their present possessors, and the choirs and transepts seem, as far as we can make out, to be devoted to the purposes of drying the linen of the clergyman and his family. At Breda we saw a clothes-line suspended across the transepts, with several articles exposed to view which one is not accustomed to see in a place of worship. We observed the same phenomenon at Bergen-op-Zoom and other places.

The churches of Dortrecht and Gouda form an agreeable exception to this general neglect, and the portions of them not used are kept in a decent condition, and not employed for unworthy purposes.

The Dutch Calvinists might profit by the example of their co-religionists of Scotland or Switzerland, who are beginning to restore and take care of the old churches in their possession (*vide* the cathedrals of Glasgow and Basle). We would suggest to them the propriety of keeping the structural portions of the buildings in good substantial repair, and protecting the sacred edifices from unnecessary and wanton desecration.

TIMBER AND CONSTRUCTION.

One architectural characteristic of the present day is the substitution of iron for various materials used in construction down to the earlier portion of the nineteenth century. The origin of the change was not of an architectural nature. It was neither the destruction of forests, the loss of skill, the sudden discovery of any new material, or property of a material, or any of those changes to which we are accustomed to attribute the previous modifications in the form of Christian architecture. But the seed and principle of the new style is referrible to the fact that, some sixty years after Watt has first learned how to derive motive power from the expansion of water by heat, a colliery labourer succeeded in applying that same power to the propulsion of carriages by land.

With the construction of the Liverpool and Manchester Railway, in 1828 and 1829, an entirely new era was inaugurated. Structural requirements were altered, and the effect of the alteration very soon became evident in monumental form. With an increased facility for the transmission of heavy weights over lines of iron rail, a demand for an improved mode of bridging over rivers, roads, or other openings sprang up. The supply and the manufacture of iron thus received a stimulus, and the iron trade, in its turn, reacted upon the designs of the architect and of the naval constructor, by giving him a material which was virtually a new one. Men of practical mechanical genius first laboured to produce structures of wrought iron of which the expense should be reduced to a minimum. Thus Sir Charles Fox, then a subaltern of Robert Stephenson, designed that simple, inexpensive shed roof, for the Euston-square passenger station, which for some time was the normal type of similar structures. The taste and lavish expenditure of Isambard Kingdom Brunel next produced the Great Western Station at Paddington. The need of bridging the Menai Straits led to the construction of the hollow box girder, and the piercing of London with railways induced the execution of those effective, but hideous bridges the aspect of which so afflicts the man of taste. Soon the displacement of architectural requisites by structural combinations that took no heed of any laws but those of strength spread from the floor to the roof,—from the bridge to the station; and men vied with one another in the erection of the largest, the most unnecessarily costly, and the most hideously unarchitectural forms that the world has yet seen.

The use of iron for railway purposes has crept in, to an extent constantly increasing, in civil buildings. Vast shop and warehouse fronts of iron are filled with plate glass. Permanent exhibition buildings are erected, of that perishable combination of iron, glass, and wood, which may answer, on a small scale, for a conservatory, but which is the most costly style of structure, as far as maintenance goes, of which we have any experience. Connected with the same increased energy in our workshops are the increase in the power of artillery, the improvements in the manufacture of shot, the launching of iron and of steel armoured vessels, and the construction of shields for fortresses, as to which, at the present moment, the art of defence is somewhat ahead of the art of attack.

Concurrently with this substitution of iron for wood, and for other materials, there has been, with very few exceptions, a wanton waste of the forest resources, not only of our own country, but of the entire world. Man has come to regard his early cradle, the forest, as an enemy, instead of as a benefactor. In England the prudent care of our forefathers to watch the growth of our forest trees—to secure a perennial supply of oak for our ships, as well as of yew for our bows, is altogether forgotten. The forest rights of the crown over a district that has been wooded since the time of Julius Cæsar—the forest of Epping,—have been so purposely neglected, that it has needed the very unmistakable expression of public feeling to elicit from the Solicitor-General anything more than a joke upon wolves and bears. The 100,000 acres of forest, under the administration of the Woods and Forests, has been so admirably managed, as to arrive at the result of a rental, at the rate of 3s. 6d. (three shillings and sixpence) per acre. The wooden walls of old England are now so much an affair of the past, that it may be said that we only regard timber as necessary to ornamental landscape, or as a material for lucifer matches.

It is in this country and its dependencies, and in those of our American descendants, that the laws of Nature as to the clothing of the earth with timber have been the most persistently broken. But we are far from being alone in our folly. To whatever part of the world we turn we see indications that waste and destruction bring their own vengeance in their train. Of the effects produced upon climate by the denudation of the soil there is no room for doubt. To a certain extent the influence of human labour in the thinning of forests is beneficial. But the limits between culture and destruction are rarely maintained. In the year 1816 the

forest came up close to the city of Philadelphia. The Delaware, a mile wide, was then often frozen in a single night. The edge of the forest has receded to a distance of more than thirty miles. The thermometer is now rarely down to zero; the river is hardly ever frozen; nor does snow lie long on the ground. In the forest it lies very long. The increased aridity of Palestine, of Spain, and of the South of France, is well known. In the former case it has been partly caused by the cutting down of the olive, a barbarous incident of warfare, merely forbidden by ancient law. In the last-named country it has been the need of fuel that has led to the denudation of so many districts, and the double evil has ensued, first, that the humidity of the climate has been reduced to a formidable extent; and, secondly, that when rain does fall, in any unusual proportions, the absence of the great natural absorbing power of forest districts allows the entire product of the rainfall to be discharged at once by the natural drainage, thus causing those floods which have proved so formidable in their ravages within the last few years.

The denudation of the forests of England is by no means a new grief. More than 200 years ago Mr. Evelyn complained of the rapid extirpation, "root and branch, of all those goodly forests and woods which our more prudent ancestors left standing for the ornament and service of their country." On the confiscation of the Church lands, in 1536, immense forests were cut down; and during the civil war that commenced a century later, many royal forests, as well as private woods, were entirely swept away. In France there yet exist 2,700,000 acres of State forest, earning a gross revenue of 1,740,000*l.* and a net revenue of 1,240,000*l.* per annum. Bavaria contains nearly 2,000,000 acres of forest; Prussia, upwards of 5,000,000; Austria, no less than 13,000,000 acres, realising an annual export value of 3,000,000*l.* sterling.

In France and in Germany exist schools of forestry in connexion with the service of the State, and men of a superior class of intelligence are carefully trained in these establishments for the scientific management of this important part of the national property.

In Bavaria there is a school of forestry at Aschaffenberg on the Maine. The candidates for admission must have passed good examinations in the higher public schools. The time of training extends over five years, half of which time is devoted to acquiring a practical acquaintance with the condition and the care of the forests of the State. The special scientific course comprises lectures on forestry, management of forests, planting, division of forests into blocks, valuation surveys, rotation of classes of timber, and the due rotation between the maximum yield of a forest and its maintenance in an uninjured condition. Preparation, transport, and sale of forest produce forms another special branch of study. Botany, chemistry, zoology, physiology of plants, climate, and geographical distribution of plants form the natural science division of the course; and mathematics, pure and applied, engineering, surveying, and forest legislation complete the *curriculum*. On passing the final examination, the students are qualified for appointments in the Bavarian forest service.

In France a similar college exists at Nancy, where from thirty to forty students are trained for the service of the State. The service is directed by the "Bureau Central de l'Administration générale des Forêts," and 849 *conservateurs* and *inspecteurs*, having under their orders 3,500 *gardes généraux*, have charge of the public forests of France.

Forest schools are also established at Hanover, Newstadt, Eberswald, near Berlin, Thurant, in Saxony, Eisenach, and other places in countries possessing State forests.

The threatened and very proximate exhaustion of the enormous forests and timber-growing jungles under the British rule in India has led to a tardy attention being paid to this important subject by the Indian Government.

From the report of Dr. Brandis, Inspector General of Forests in India, it appears that the normal average of first-class teak trees in a virgin forest is fourteen per acre. A teak forest at Maulmain, in the hands of the Government, extending over 550 square miles, has been found to contain only three full-grown trees in two acres, while damaged trees and stumps abound.

Forests of the Sâl, or Saul, tree replace those of teak in Central India to the north of the Nerbudda river. A belt of forest, from five to twenty miles wide, extends for a length of 1,500 miles along the foot of the sub-Himalayan range, and up to an elevation of 3,000 ft. The Saul tree grows socially, and by its dark green foliage excludes the growth of other trees; being unlike the teak in this habit of growth. In Oude and Nepal the jungles contain as many as seventy first-class trees per acre, together with from 200 to 300 of all sizes, springing up from seed. The system of letting these forests by contract in annual leases to the highest bidder, while bringing in a positively insignificant return, has had the effect of stripping all the accessible parts of this large district of full-grown trees. Such is the size attained by this noble tree, which, with a specific gravity less than that of oak, possesses from one and a half times to twice the strength of that wood, that the Nepal ferry-boats, used to contain from ten to fifteen men, with horses and cattle, are hollowed out of single logs. The tree takes about 100 years to arrive at this size. The British Sâl forests are computed to cover more than 3,500 square miles, and a rest of forty or fifty years will be requisite to replace this waste of first-class trees which has been so blindly permitted to go on.

From the state of the Sâl forests it may be concluded what is the condition of the supply of teak, a tree which grows so much more sparely in its natural home. In 1822 the forests which the native princes had studiously preserved were thrown open to the public. Within eight years it was discovered that, owing to indiscriminate cutting, teak timber fit for Government purposes was growing scarce, both in Madras and in Bombay. In 1839 Mr. Williams, the dockyard manager, reported, that within twenty-one months 40,000 teak-trees, between 12 in. and 6 in. in diameter, had been floated down by the contractors, whose indiscrimate waste was thus destroying the resources of the future. So great had been the destruction, that in 1842 the Government actually purchased 260 square miles of forest land, for replanting with young teak, for the use of the dockyards. It was found that the expense of thus preparing a single acre of forest nursery was greater than the value of the timber which could be grown on a square mile in 100 years! During the thirty years preceding this futile attempt to repair irreparable waste, the forests of Malabar, Canara, Goojerat, Bombay, Madras, Rajamunduy, Coimbatore, and Cochin, stocked with first-class trees fit to cut, and with an ample supply of young trees in all stages of growth, had been given over to destruction. The contractors took no heed of those who might come after them, and cut everything that came to hand.

During this time the forests of the Rajah of Travancore, under the charge of an English conservator, had yielded a regular revenue, while still containing a full supply of first-class trees. For every ten trees fit to cut, two were left for seed; and for every tree actually felled, ten were planted.

The teak-growing districts of Burmah extend over more than 7,000 square miles of forest. A system of well-devised management has been introduced into this district, in 1860, by the conservator, Dr. Brandis. The forests are divided into six divisions, of upwards of 1,000 square miles each, containing an estimated number of 100,000 trees in each district. The trees are divided into five classes, each individual being allowed a period of twenty-four years in each class, thus making the total life of the tree, from the germination of the seed to the felling of the timber, 120 years. The ordinary average of the forest gave 100 trees of the first, second, and third classes, and 200 of the fourth class, per mile. By cutting, therefore, only eighty of the first class in twenty-four years the forest is uninjured, and in the course of 120 years its stock of timber is entirely replenished.

The specific gravity of green teak is greater than that of water. The dry timber, on the other hand, will float. It is therefore the practice to mark and girdle the trees three years before felling. The tree is killed by the destruction of its bark, and dies *in situ*. When felled it is dragged to the rivers by elephants, and floated down to Rangoon, the Government paying so much a log on its arrival. Under these arrangements the Burmese forests have kept up a good supply of timber without exhaustion, and have ensured an annual profit to the Government of 60,000*l.*, besides providing for the expenses of their own conservation, amounting to more than 30,000*l.* a-year.

No less important than the conservation of our extensive forests, inexhaustible as they may prove under proper management, although readily destructible by the waste which we have been accustomed to allow, or rather to practise, is the introduction to the knowledge of the English builder and manufacturer of those noble and beautiful species of wood of which we command so great a variety. It is incredible to what an extent this part of the subject has been neglected. At the Paris Exhibition of 1867, timber from no less than 3,769 distinct species of trees was collected from forty-five different countries. Of this large number Europe contributed 395 species. Africa yielded only 252, showing that the resources of that large continent were almost virgin. Asia produced 853 species, Oceania 966, and America no less than 1,298.

Among the most notable of these materials for the builder may be mentioned the *Eucalyptus Amygdalina* from Victoria, which attains in the valleys of Daudemony and on the Yarra river the height of 420 ft. Dr. Mueller says that this amazing height is by no means exceptional, and that it is due rather to great rapidity of growth than to extreme age. The "white gum" (*Eucalyptus Stuartiana*) and the "stringy bark" (*Eucalyptus obliqua*), are said to exceed 300 ft. in height, and to cover the plains and more barren mountains of Victoria. From the same vicinity come beautiful ornamental woods. The *Senecio Bedfordii*, a curious striped wood, and the *Banksia serrata*, marked with a pattern like network. Gipps Land produces the *Eucalyptus longifolia*, said to last in the ground for twenty years, and the *Acacia supporosa*, an elastic wood resembling hickory, and yielding straight spars from 50 ft. to 100 ft. long.

British Guiana produces the "Greenheart" (*Nectandra Rodeii*), called the natives Sipicu, a timber which is remarkable both for its great durability and for its extraordinary strength, which is three times that of oak. Balks of this timber, squaring from 18 in. to 24 in., may be had from 60 ft. to 70 ft. long without a knot. In the same locality, the mora (*Mora excelsa*) attains a majestic height of from 100 ft. to 150 ft. It is so tough that it is sure not to splinter when struck by cannon-shot. Its strength is more than double that of oak, and it is said to be exempt from dry-rot. Of the seven species of timber which form the first class in Lloyd's classification for shipbuilding, oak, which heads the list, seems to be far inferior to the East Indian, the Australian, and the African timber, to which we have referred. The list includes seven species of timber, the ordinary European oak (*Quercus robur*), the live oak of North America (*Quercus virens*), African oak (*Quercus Africana*), teak (*Tectona grandis*), and sal (*Shorea robusta*), from East India; mora (*Mora excelsa*) and greenheart (*Nectandra Rodeii*) from British Guiana, and iron-back (*Eucalyptus*, species not named) from Australia.

It is beyond the limits of our space to describe the varied, mottled, striped, and coloured woods which offer such admirable materials for the artist, whether for furniture, for doors, skirtings and wainscotings, or for inlay work. The use of dyed or stained wood for the latter is rendered unnecessary by the bounty of Nature. From the pure white of satin wood, and of numerous other species, to the full lustrous black of ebony, we can simulate almost any that form the resources of the vegetable world. French Guiana produces a violet wood of extreme beauty, the "Bois violet" (*Copaifera bractata*), and the *Caryocar glabrum*, a splendid yellow timber. Brazil has a red wood fit for any kind of furniture, the "*Echrospermum Balkasarii*," and the *Dalbergia nigra*, a beautiful rosewood. Venezuela has a zebra wood (*Cordia zebra*); Natal produces sneezewood (*Pterowylon utile*), equal in beauty of grain to the best bird's-eye maple; Canada its white and pencil cedars (*Thuja* and *Juniperus Virginiana*).

It is needless to refer to the economic products of the forests, apart from the actual timber: turpentine, resin, Burgundy pitch from the pine forest of the Lauder; cork from the South of France, Corsica, Algeria, Italy, and Spain; gum *animi* from Zanzibar; gum *copal* from Angola and Sierra Leone; gum *acacia* from Senegal and Mogador; gum arabic from different sources; palm, cocoanut, and other vegetable oils; coir and fibre; bark for tanning; osier and bamboo; corozo, or vegetable ivory, and nuts for turners' work (*Phytelephas macrocarpa*) from Ecuador; the vegetable wax of the Carnauba palm (*Corypha cerifera*) from Brazil; caoutchouc, the milky sap of the *Siphonia elastica*, and other elastic gums, as well as logwood (*Hæmatoxylon campechianum*), and other dye woods, from the same rich vege-

table district; bark mat from the bark of the lime, the Russian source of supply for cordage, bags, mats, sandals, bassets, horse-collars, packing-cloths, and other purposes; black and grey moss from Louisiana, used by upholsterers for stuffing; "forest wood" for the same purpose, formed from the needle-like leaves of the pine, essential oil from the same tree, balsam and spice. Such are but a few of what may be called the incidental products of the forest.

Our purpose will have been accomplished if we have succeeded in awakening attention, first to the fact of the invaluable stimulus to art, in all its branches, no less than to civil and naval architecture, that must result from the attainment of a competent knowledge of the vegetable kingdom; and, secondly, of the absolute importance, as a branch of the great profession of which the architect, the engineer, the shipwright, and the surveyor, are alike essential members, of the intelligent study of forestry.

WESTGATE BAY, ISLE OF THANET.

A NEW WATERING-PLACE.

Lately, when speaking of Margate, we mentioned some intended building operations on the west side of the town, and prognosticated a good future for this popular watering-place, if the authorities acted wisely. Still further west, though not far, an entirely new location has been made, which bids fair to become in a very short time a favourite resort. About a mile and a half from Margate there are two fine bays, one of which, marked on the maps Westgate Bay, gives the new place its name. The control of the land, some 500 acres in extent, has come into the hands of Mr. Corbett, of the firm of Corbett & McClymont, of the Redcliffe Estate, Brompton, and with the same energy and clear-headedness which have in a marvellously short space of time covered the latter with good houses, and brought to it a population, this gentleman, with several supporters and friends, has set to work to make Westgate a fine watering-place. About four miles of roads have been completely formed and named, as Cuthbert-road, St. Mildred's-road, Sea-road, Westgate-road, Wilson-road, and Domneva-road; a sea-wall and esplanade are being constructed around the two bays, a certain number of houses have been erected, an hotel is about to be commenced, and the site for a church is marked out. The London, Chatham, and Dover Railway Company, whose line passes through the estate, are naturally greatly interested in its progress, and are, we believe, about to form a station there at once. When we add that arrangements are nearly complete for the erection of gas and water works on the estate, it will be seen that the right steps have been taken, and that the style of the beginning promises well for the end. At present good water is obtained from deep wells in the chalk. Mr. Wigmore, who was the contractor for the roads, is building himself steam saw-mills and other workshops, and will probably aid in covering the land.

On a plot of ground within the estate some houses have been erected with the materials patented by Mr. J. Taylor, his facing bricks with concrete-backing, roof-tiles, and so forth, and within these much ingenuity is exhibited in turning space to account.

The houses built by Mr. Corbett are good sound structures designed by Mr. Beazley: they are detached, and, wisely, a good area of garden ground is allotted to each. Professor Erasmus Wilson, Mr. Spencer Lewin, and others who are known have already located themselves at Westgate, and are interested in its welfare.

The sea-wall and esplanade in progress, to which we have already alluded, are a considerable work. The walk is being formed by cutting down and shelving back the cliff, the wall by blocks of Portland-cement concrete, with granite facing, the top of which will be paved or asphalted with the esplanade. To make the work complete, it should be continued round the headland which occurs between the two bays; and it would then present an unrivalled sea-walk more than a mile in extent. Mr. Birch is the engineer, and Mr. Oakes the resident superintendent.

The views embrace Reculvers on the left, Margate on the right, with Daundelyon, Street (the residence of Mr. Mertens), and Birchington inland. Minster and Canterbury, rich in associations, are handy for drives. While we were on the spot, we were reminded of its connexion with early times by the turning up of part of an oddly-shaped vessel in fictile ware, Mediæval if not Roman. Westgate has certainly many natural advantages, and we shall be surprised if it do not prove attractive first to builders and buyers, and then to the general public. It has the fine air and open sea of this part of the coast, with great quiet, and rural surroundings; and yet a ten minutes' ride, or a twenty minutes' walk, will take those who seek a little life and variety to the gaieties of the Jetty, or to Halls by the Sea. We very cordially wish the pioneers success. There is no time to lose on the part of those who would get ready for next season.

RESTORATION AT THE BRITISH MUSEUM.

All kinds of objects of art are in these days restored,—buildings, statues, paintings, furniture, things large and small, useful and useless, valuable and worthless,—and they are restored or attempted to be restored in all sorts of ways, both by adding to them and taking from them, by cutting away the surface and by painting over it, or covering it up. It is difficult sometimes to discover how most effectually to destroy the artistic value of the original work, and to blot out the impress of the original artist and the marks of his mind and hands. There are not a few things so completely coated over with layers of oil-paint that it is impossible to say what the real substance is of which the object itself, whether building or statue, or chair or table, is made of. This is one method, and we are just now led to think about it from the very singular fact of two of our most notable possessions in London city undergoing a process of restoration in a directly opposite way. We ask our readers' attention to them, for they are well worth a little thoughtful consideration, and show how much there is yet to be examined into and studied. St. Paul's Cathedral is, by way of restoration, covered over and hidden away under four or more thick coats of oil colour or paint, so that it is impossible to say what the building is made of; while the *Greek marbles* from the world-renowned Parthenon or Temple of Minerva, Athens, are as industriously in rapid course of *restoration*, not by covering them over after the model of St. Paul's, but by the directly opposite system of removing, through the aid of powerful chemical agents, — some chlorine mixture, we suppose, for there is nothing else powerful enough,—all the weather marks and evidences of age which time had impressed on the surface of the marble! The simple-minded reader who is new to these profound subjects will therefore at once see that there is more than one way of "restoring" a work of art, and that it depends on the fancy of the restorer how it is best to do the work, and how the restored object shall look when the tremendous feat is accomplished. It would perhaps be a difficult thing to say which is the most precious to Englishman, St. Paul's Cathedral or the Parthenon marbles, and in presence of which two things of beauty he may be said to feel most at home; but of one thing we are certain, that they both of them cost him a vast sum of money, and so he is not a little interested in their *preservation* and careful keeping, and thus that his successors may see them as well as himself. Leaving St. Paul's for the present, let us glance for a moment at the work now going on at the British Museum.

Every reader of the *Builder* knows that pure Carrara marble, when fresh from the quarry, is of the most beautiful snow white; indeed, perhaps among natural substances there is no substance more beautiful and refreshing to eyesight than this pure and spotless marble. When the surface of this marble is cut by the successive and minute cuttings of a fine chisel, the surface of it, without being polished,—and the reader is requested to bear this in mind,—acquires a wonderful *transparency* and depth, which makes this substance so fit for the purposes of the sculptor, and so capable of expressing the form and texture of flesh and muscle. But Carrara marble cannot be kept long in this state, or in its state of pure snow whiteness: after a little time, a few weeks or months, it changes colour, and if left to itself becomes of a fine stone-colour. Now, charming as the pure white of the fresh quarried substance may be, it is for the purpose of sculpture a more appropriate colour, and better for its purpose, when it has passed into pale cream-colour, and thence into pure stone-colour, and we may presume no sculptor would hesitate which to prefer of the two, the pure stone-coloured tint being so much more expressive of the nature and colour of the flesh which it is the aim of the artist to imitate. All this applies to the Carrara marble only. But the Greek marbles in the British Museum are made of the equally celebrated Pentelic marble, which is not, even when fresh from the quarry, pure snow white, as is the Carrara marble, but a fine pale cream or stone colour; and it would seem under a clear sky to have the property of retaining that colour for a great length of time, though growing by slow degrees somewhat darker in hue. Of all the marbles it is the best fitted for the purposes of the sculptor, and acquires under the action of the chisel that fine polish which approximates it to the texture and colour of the living flesh. Phidias certainly could not have had a better substance to go to work on. Thus circumstances seem to have all united together to make up the perfection of Greek sculpture,—the man, the substance used, in texture and colour, and the glorious forms by which he was surrounded,—and in the British Museum we may see, or might have seen, the result of it. But what has been the sad fate of these famous and fortunate works? Why, they must have remained for centuries up in their safe niches in the Temple itself without harm or injury of any kind, until the unfortunate seige of Athens, and the blowing up of a powder magazine destroyed so many of them, and injured so many more. It was reserved for Lord Elgin to lay hands on them, and to cause their removal to England, and their sale to the then Government, and their final deposit in the British Museum, where they now are. Let it be recollected that when first brought to the Museum their *colour* had, perhaps, suffered but little: breakages and flaws there were in all directions, but they were all fairly in the same state as when taken down from the building for which they were cut. Of course they were not totally free from weather and time marks. During the time they have been in the Museum no change has taken place in them, with the solitary exception of their becoming—in this climate unavoidable—slightly darker in colour, no attempt happily having been made to restore them, or make up the deficient and broken parts. But, in an evil hour, it seems to have occurred to some one connected with the Museum that some process of restoration or revival might be advantageously applied to them,—not by the tampering with the *form*, but with the *colour* of them, and the unhappy consequence has been, that now nearly the whole of the slabs from the frieze have been subjected to some process of "cleaning," as it is termed,—in other words, by aid of some powerful chemical, chlorine, or alkali, or acid, these marble slabs, and not a few other things, have been thoroughly soaked, so to speak, in this powerful substance, and subjected to its *dissolving* powers, or powers of eating away the substance of the marble. By this process the polish produced by the chisel is almost totally effaced, and the close grain of the marble eaten into and made coarser. It is very difficult to make this marble-cleaning process clear to the mind's eye on paper, but it may be seen clearly enough—nay, but too clearly—in the "Roman Room" of the Museum, in the bust of Marcus Antoninus, where the fact of its having been *washed* is but too painfully evident. It may be also seen in the figure of a Satyr in the next room, close to the doorway. We mention these two objects especially, because the result of washing and cleaning is so strikingly evident, and because, when thus viewed, probably no one is likely to see anything in it but *destruction*,—total destruction, if repeated. The slabs from the Parthenon frieze have been treated in the same way, and the object has evidently been to remove the weather stains, the marks of age, the deepening tint which time always gives, and to make the marble look as if but just newly quarried. But to do this you must go deep into the substance of the marble block, and must remove something in the process, and that something is the fine marble polish and close grain of it, and something, too, and that not a little, of the subtle impress of the hand of the executive artist, and, what is more than all, the peculiar and living flesh-like look of the marble surface always to be found in the genuine and untouched work of all the great artists who have made sculpture the means through which their artistic power has manifested itself. It is very difficult to see how destruction *could* be more complete of exquisitely fine and subtle work. All is not yet gone, though so much is: would it not be advisable to let what remains alone, and to be contented with simple washing with sponge and water? And be it observed that even this operation, simple as it seems, should

be done by a skilful and careful hand, and not by a mere "labourer" or ordinary "attendant." It is truly sad to see how things are going on at the British Museum. It is worth attending to; for the guns of the German army, if firing into the very centre of the great Louvre, will scarcely destroy more effectually than the British Museum system of "cleaning" statues and figures destroys!

But one thing more there yet is which is not only painful to see, but truly absurd, and one would like to know who suggested it. We refer to the system of putting works of marble and sculpture *under glass*, so that you cannot see them except through the medium of the reflections of skylights, your own face, the passing crowd, and the opposite wall. When we come to think that these sculptured slabs of marble have battled so well some 2,500 years of time and weather, and the hand of man, on the top of a high hill, in the middle of a great and famous city, and have yet come down to us with the impress still on them of the sculptor, does it not seem absurd to put them under glass to preserve them from dirt, and an enlightened English crowd in this nineteenth century of education and progress? What harm can come to them if left fairly visible and uncovered, and so that any may see the marble surface and the tool marks of the workman, and the evidences of the marble-cutting powers of the executive artist, of Phidias himself? What a change will take place in art when our influential art societies come to notice such ignorant ways as these, and to so far interfere as to at least protest against them. We are an art-educated and enlightened people, and the result of it is, in a great public institution like the British Museum, to first destroy as far as may be the splendid works of the past, and then to put them under a glass case, so that it is impossible to see them except through the medium of the reflections of an opposite wall or a passing crowd!

HEALTH AND HOUSE-BUILDING.

Returning to our reference to the proceedings at the Newcastle Congress of the Social Science Association, we give a portion of Mr. Rawlinson's address, as president of the Health Department. We will return hereafter to what was said by others with more special reference to Newcastle itself:—

So far as history illustrates or explains anything connected with the past condition of the masses of mankind, the story is one of utter State neglect in securing decent home accommodation. In ancient times the masses were slaves or worse than slaves, as ownership imposed some responsibility, but the free peasant has been for the most part utterly neglected, and was left to house himself as he could. This has been true of the past, and is also true of the present, over the entire surface of the inhabited portion of the world. It is true of country districts, it is also true of towns and cities, however magnificent they may be in their outward appearances. To describe the mud and bog cabins of Ireland, the bothy of Scotland, and the cottage of England, would be to depict nests of foul air, of scrofula, of physical debility, and of moral impurity. The sanitary defects which exist in the lower class dwellings of Great Britain, exist in the lower class dwellings of every nation and people on the face of the earth. There are reports in abundance on English, Scottish, and Irish villages and towns, setting forth the facts in all their hideous details. Single rooms occupied by all the members of a large family, males and females; father, mother, brothers, sisters, and male and female lodgers (sometimes pigs and dogs), mixed in one nest of impurity. Poverty is not always the cause, and, if it were so, should this continue to be a satisfactory excuse? Will sanitary reports, describing the wretched abodes of the teeming populations, or sanitary rules and recommendations left to chance enforcement, avail in enabling the country peasant, or the town artisan, to follow the advice given? If the work of the State stops with reporting and recommending, may not its action be termed "a delusion and a snare?" Poverty is recognised by the Poor Law, and property is made to bear the pecuniary burden. Sickness is recognised by private charity; hence the building and support of public hospitals, and charity is thereby made fashionable. Crime is provided for in the erection of gaols; and the maintenance of legal tribunals, and of punishment, becomes the work and cost of the State. These arrangements are, at this moment, the outcome of civilisation in England. Sanitary legislation, it is true, commenced in 1848, and Act upon Act has since been piled up, one to mend the other, until confusion is the result. Men, "learned in the law," cannot even understand, and of course cannot interpret, these Acts. A Royal Commission, under the chairmanship of Sir Charles B. Adderley, M.P., has been taking evidence relative to sanitary law, and is expected to make a report, with recommendations, in time for the Legislature, in 1871. Whether Parliament will provide any practical remedy for improving human dwellings remains to be seen. Poverty of the occupant is a plea which may be put forth by the peasant in the country, and also by the labourer in the town, and which cannot be gainsaid. The unaided poor cannot provide their places of residence, but must exist in such as they find; the poverty of the individual is, therefore, an effectual bar to improvement by him,—he must take his health and his morals as provided for him by others. If born with an unsound constitution, poor-law taxation will, however, keep him. If example inculcates crime, he will oscillate in and out of gaol. The worst of the males learn crime, and live by it. The most tempted of the female portion of such families drift into prostitution. The wealth of the State is not saved by this mal-arrangement, a fact which has been explained over and over again. Defective house accommodation produces disease, immorality, pauperism, and crime from generation to generation, until vice has become a second nature, and morality virtue, truth, and honesty are, to human beings so debased, mere names. The money expended in relieving pauperism, in detecting and in punishing crime, and in supporting the sick, if properly expended, would provide sufficient funds to furnish improved house accommodation. Taking floor areas and cubic space into account, and the money expended within such spaces, it will be found that wretched dens of misery and vice are more costly to the community than any equal area and cubic space in a palace. There are tenements by hundreds of thousands which generate sickness, pauperism, and crime, the cost of which is paid for out of rates, and yet such property is not worth more than from three to five years' purchase; but the round of degradation is allowed to go on. Zymotic diseases cut down the head of a family. Typhus removes a father in the prime of life, and the family is then left to the care of the parish. "Once a pauper always a pauper" has become a proverb. Statesmen have, therefore, this lesson to learn,—namely, that that which is necessary to the well-being of society, and which individuals cannot provide, but which States can provide, must be the bounden duty of the State to furnish. No excuse can be valid. It does not follow, as an inference from these arguments, that States must build and own cottage tenements; but it may be inferred that States ought to frame laws, and provide means and machinery for enforcing such laws and regulations as are necessary to bring about the required improvements. State aid has been and is afforded in many forms, but upon no defined or settled principles. There are Exchequer Loan Commissioners, who, however, are only State hybrids—they are not a Government department, neither are they independent, but, being in connexion with the Chancellor of the Exchequer, they can advance State money on loan for various purposes. Parliament also by fits and starts votes money for public purposes outside strict Government requirements—as to relieve the Irish Famine, 1846-7; to drain agricultural land; to promote special occupations, as fisheries; to construct roads, canals, harbours, and river improvements; and to provide for the execution of sanitary works, as in Lancashire during the cotton famine. Corporations and local boards can also borrow money from Government for main sewering, waterworks, and general improvements; but not on any simple, easy, and equal principle, and the rates of interest charged vary from 3 per cent. to 5 per cent.; also Exchequer loans are, as a rule, discouraged. The question may be asked, Should the State halt and stop on the threshold of so wise an arrangement as lending money to aid sanitary improvements? The money (1,750,000*l.*) lent to the distressed cotton district (1863-69) has been expended on works of a permanent and sanitary character; such as main sewers, house drains, forming streets and roads, constructing waterworks, and other works of local improvement, thereby securing to the inhabitants means to enjoy health, comfort, and greater facilities for locomotion and trade. The advance of this money relieved local distress, at no cost to the State, because the local rates are mortgaged as security, and both the principal and interest (at 3½ per cent.) will be repaid to the uttermost farthing, "within a period not exceeding thirty years." If Government would lend money at this rate of interest to enable parish authorities, town councils, local boards, improvement commissioners, and other similar public bodies, to improve dwelling-houses, to sewer, drain, construct waterworks, markets, &c., and to effect street, road, and other town improvements, the progress of the whole country in sanitary improvements would be rapid, and the Registral-General would soon be enabled to record the beneficial results in his returns; pauperism would cease its alarming growth, and crime would be lessened. The first steps in sanitary progress are, as previously indicated, special examinations and faithful reports; and then remedial measures ought to follow. The inspections and reports in England have (to some extent) been followed by works, and, at the present time, the Local Government Act (1858) has been adopted in some 700 places, and the number is being added to. A sum of about 8,000,000*l.* sterling (exclusive of the metropolis) has been expended on the various works provided for by the powers of the Act, such as sewering, draining, water supply, road and street improvements, &c. To put the whole of England in a similar sanitary state will cost about 50,000,000*l.* in addition. In round numbers, the sum of 2*l.* to 3*l.* sterling per head of the populations under the Act may have been expended. Large as these figures appear when thus stated, the expenditure is (and will be) a relief and not a burden. House property is (and will be) increased in value, and, in so far as causes producing zymotic diseases are removed, the ratepayers enjoy better health, earn fuller wages, and are, consequently, better enabled to pay the rents demanded. There are many persons, however, who do not appear to value health, if providing the means to obtain it touch their pockets. These persons in towns and villages are, small shopkeepers (in business or retired), small speculative builders, and owners of cottage property, generally owners of those of the worst class, which, on account of their badness, are relieved from paying rates, but in which fever and pauperism are manufactured with singular regularity, the parish relieving officer indirectly, but nevertheless regularly, paying the rents. Since the Crimean war, and the effective work of the Army Sanitary Commission, there have been commissions, inquiries, and reports, as to barracks and hospitals on home stations, and works have been carried out of sewerage, drainage, water supply, and of ventilation, the results being a great reduction in the sick rate, and a reduced annual army death-rate of about 8 in each 1,000.

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In the cities of the Republican States of North America, the worst sanitary defects of the worst cities of Europe are being repeated. The sanitary engineer of the future will know nothing of "refuse matter" other than as a useful product, which, properly applied to the soil, will add to the wealth of the community. The aim and end of statesmanship ought to be to insure to every individual born in the State means of health and of morality. Each Englishman's home should not only be his castle, but his hospital. Charity will not then degrade, but will elevate; and that alone will be true charity which assists the poor to assist themselves, and so to live, independent of almsbegging and almsgiving. We are now proud of our charities, of our public hospitals, which cost 1,000*l.* per bed, plus the additional expenses of administration, in which hospital-beds sick men are treated at a money rate three times greater than the wages they could ever earn when in health. "Our charitable institutions are the glory of our land," but happy will that State be which neither possesses nor needs such form of glory. We repeat at our great musical festival the angelic chant, "Peace on earth, good will to men," but we read in our daily papers of carnage such as the world never before knew; we cannot explain the terrible phenomenon, but stand aghast in dread, fear, and wonder. The war epidemic is upon the nations, and must run its course. Sanitary science under such conditions as are now in existence appears to have laboured in vain. But it is our duty to work in hope and wait. War and carnage are not the end of Christian teaching: we must strive to look beyond the present, and hope for

better times. The poet, using his divine faculty, states,—

"For I dipt into the future, far as human eye could see,
Saw the vision of the world, and all the wonder that would be."

And in another verse the same poet embodies the hopes of men, who believe in revelation and do not despair, in words with which I conclude this address:

"Yet I doubt not thro' the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process of the suns."

SOCIAL SCIENCE IN NEWCASTLE.

Amongst the subjects discussed at the recent congress of the Social Science Association,

The Employment of Children in Brick and Tile Making,

was treated of by Mr. George Smith, of Leicester, who stated his own experience when a child, and continued:—

A sub-inspector of factories informed me the other day that he had visited several brick-yards in the Midlands, and found the children were of various ages, from nine to twelve, but mostly nine to ten. They were of both sexes, and in a half-naked state. Their employment consisted in carrying the damp clay on their heads to the brickmakers, and carrying the made bricks to the "floors" on which they are placed to dry. Their employment lasts thirteen hours daily, during which they traverse a distance of about twenty miles. It may be asked why the inspector did not interfere. He could not, the Act not applying to establishments in which less than fifty persons are employed. Any person visiting these brick-yards will soon discover the need for something being done for the poor little ones. Imagine a child of nine or ten, with features prematurely old, toiling from six in the morning until seven in the evening, and receiving nothing but curses and blows from the men because he is not quick enough in his movements. What s it but actual slavery of the worst description? No wonder many of these children find life a burden to them. Of course, the natural results ensue. Ignorance and immorality prevail to a fearful extent among the workmen and children so employed. How could it be otherwise? All goodness and purity seem to become stamped out of these people; and were I to relate what could be related, the whole country would become sickened and horrified. The employment of girls under the age of eighteen in brick-yards ought to be rendered illegal. The present system is a prolific source of immorality and vicious habits of the worst kind, even more so than the agricultural gang system once prevalent in some of the Midland Counties. Out of the many hundreds of brick-yard girls whose career I have personally marked not more than half a dozen have become decent and respectable wives. If we wish to remedy the evils to which I have,—very slightly, I fear,—alluded, a change must be made in the present system of Government inspection. At present brick-yards, employing less than fifty hands, are exempt from Government supervision. The absurdity of such an arrangement is obvious. In my own neighbourhood there are several brick-yards, one of which, having more than fifty hands, is under Government inspection; the others are not. In the larger yard, a lad of about twelve years of age was prohibited working by the inspecting surgeon: the very next day that lad was to be found employed in one of the smaller brick-yards, and working eighty-four hours in each week. Now, this is the kind of thing we ought to prevent. But a practical solution of the difficulty is to be found. All establishments, no matter how many hands are employed, should be placed under the Factory or Workshop Acts. The former Act should be made to apply to all light trades, in which the half-time system can be adopted; the Workshop Act being applied to those trades in which heavy manual labour is required, and in which the half-time system cannot easily be introduced. Under the present arrangement, it is difficult to tell under which Act an industrial establishment is to be placed.

On the subject of

National Prosperity and Social Security,

Mr. Francis Fuller read a paper. He stated, as a mischievous anomaly, that whilst, by the adequate application of labour to the cultivation of the waste lands in the United Kingdom, such lands could be made to produce, with commercial profit, an annual value of at least 100,000,000*l.* sterling in ordinary articles of food, we pay foreigners in some years nearly 50,000,000*l.* sterling for the very things which could be profitably produced at home. At the same time, hundreds of thousands of people were in distress from want of work, hovering precariously about the narrow lines which separate indigence, pauperism, and crime; and notwithstanding our large imports from abroad, the greater portion even of the employed population were under-fed, and suffering from an insufficiency of the nutritive food which, if the measures advocated by the "Industrial Employment Association" were adopted, would be superabundantly supplied from our own soil. In this plan, Mr. Fuller maintained, would be found a satisfactory solution of the ominously increasing difficulties of the labour question. As connected with that question, he dwelt upon the urgent and imperious necessity of rescuing from ruin of soul and body the multitudes of the young of both sexes who are now growing up in the ways of all evil, to become hereafter the curses and cankers of the body politic. In agricultural pursuits, and the numerous branches of industry which come into operation collaterally with them, and an improved cultivation of the land, existed the only practically inexhaustible field of employment. By this policy the young would be trained to independence, and be enabled to gain a good livelihood at home, or become healthy, vigorous, and prosperous colonists.

The necessity for—

Legislation to prevent Adulteration of Food and Drink,

was urged by Mr. Philip Beavan.

After giving some valuable information as to legislation abroad to prevent adulteration, Mr. Bevan said, any fresh legislation on this subject should be compulsory in its character, and not permissive. All articles of consumption which are manufactured should have their ingredients declared, for there is a feeling prevalent amongst manufacturers, as for instance, cocoa-makers, so that as long as their articles contain nothing hurtful, they are at liberty to call them by the general name of cocoa. Still, a sophistication is, to a certain extent, a fraud, and every purchaser has a right to know what he is purchasing; and although we might be safe in the hands of the largest and most respectable manufacturers, there is a considerable class of unprincipled makers who are not above taking advantage. Differences of opinion sometimes occur as to the relative hurtfulness of certain common adulterants; and an eminent authority has assured me that he had grave doubts as to whether alum was not a good thing instead of a bad one. I would suggest that there should be a Food Sub-department formed, which should take cognisance of all food legislation and supplies. To it a Board of two or three of the most eminent analytical chemists should be attached, who should examine and pronounce upon all disputed chemical questions, and whose opinion should be law. The sub-department should have the election of, and a certain amount of control over, the county and borough analysts, whose appointment should be compulsory and not permissive; neither should it rest with vestries or corporations, many of the members of which are often largely concerned in adulteration. Inspectors should have power to visit and take samples from all dealers in articles of food, subject to certain checks, so as to prevent any risk of tyrannical domiciliary visits. They should also have the power of testing the supplies furnished to public bodies, such as union contracts; for guardians have frequently a habit of accepting tenders for food at a price at which the real article cannot possibly be supplied; as a London Union Board did the other day in the case of butter. In cases where a petty dealer declares his ignorance that the goods which he sells are adulterated, I should make the onus of proving this fall upon him, and then it would be for the Food Sub-department to take the matter up, and prosecute the manufacturer. When adulteration takes place before importation, as in the case of the Malo tea mixture, the department might well provide the machinery for setting consular and other influence to work to prevent it; and might also step in as the proper arbiter between conflicting interests. In this very case, a great fraud on the public was allowed to go unpunished, because the Customs could not legally forego the duty.

As to offences, when proved, I am no believer in either a very small or a very large fine; but I would have no sliding-scale at the option of the magistrate. For the first offence the penalty should be sufficient to make the offender smart in his pocket; for the second, I would double it, and have an *affiche* detailing the offence put outside his door, as also outside the door of the church, police-station, and townhall, for a month. The case should also be advertised in the local papers at the offender's expense. For the third offence there should be imprisonment for one month, with hard labour. Adulteration is either a fraud, or it is not, and it should be punished like any other cheating.

Sewage and Sanitary Works.

Mr. J. Brierley, C.E., of Blackburn, read a paper on "Sewage and Sanitary Works," setting forth the result of his observations, and making a series of suggestions which that experience had given birth to. In laying out a sewerage scheme, he remarked that a close inspection in detail of the whole district was necessary, taking into consideration the population and probable increase, the death-rate, the rateable value past and present, prevalent trades, existing works, amount of rainfall and water-supply, and the geological features of the district. He laid down the following doctrines:—The whole scheme should be laid out, although executed only in sections; main outfalls should be as few as possible; each drainage area should be treated as a separate district; a careful study of the size of sewers would save expense; circular sewers are better than oval up to 2 ft. diameter; to save cost storm outlets should be provided with self-acting overflow; subsoil waters should enter sewers by junctions; the separate system is not generally practical or desirable, because subsoil water and rainfall help to flush the sewers, though excess would reduce irrigation power. Legislation to prevent steam pollution is imperative; transferring solid matter into streams ought at once to be prohibited, but reasonable time should be allowed to intercept all sewage. Sewers should be constructed of earthenware pipes up to 21 inches, above that size of bricks; should be laid down in straight lines, and freely ventilated, to render the gases innocuous. Scavenging and night soil removal should be done by corporations, and not farmed; ash-pits should be covered, and kept dry; excreta and other rubbish should be kept separate, and cleansing must be frequent; water-closets must be provided with an ample flush of water, good ventilation, and efficient drainage. Public water-closets and conveniences might be placed underground in large cities. Each community of 30,000 and upwards should have a medical officer of health; inspectors of nuisances should be intelligent, and large communities should be divided into districts, and furnished with an inspector for every 10,000 inhabitants; the death-rate statistics should be localised, so that disease manufactories might be fixed on, and improved off the face of the earth. Mr. Brierley illustrated his paper by excellent drawings of works carried out in accordance with his theories.

The Labour Market Question.

Mr. E. W. Holland read a paper on the question, "By what means may the labour market throughout England be more equally supplied, with special reference to local and temporary distress?" After describing the difficulties at present experienced both by the employer and employed in meeting with each other, and laying stress upon the helplessness of ordinary labourers in the matter of finding out where work was to be obtained, Mr. Holland went on to recommend the establishment of a national system of labour registration upon a self-supporting basis. He could not advocate, as some persons had done, that the machinery for this purpose should be supplied by the Poor Law, because that would tend to make labourers fall upon the rates for support, and, finding no Governmental agency exactly suited to the work, they came to the conclusion that the Post Office was the best agency that could be at present fixed upon. He looked forward to the day when the Government provident institutions would be extended and erected into a separate department, which would then most suitably undertake the registration of labour. Till that time arrived, the Post-office must keep the labour registers. The registers kept in the various districts should be sent up to the central office, and there compiled into a labour gazette, which would supply the most valuable information as to the state of

the labour market all over the country. A provident travelling fund for workmen should be established in connexion with the registration scheme; and it might be advisable to bring pressure to bear on the railway companies to pass such workmen to their destination at reduced fares. Proceeding to discuss the question how under existing circumstances the workmen's usual difficulty in supplying his means of transport to any given field of labour might be overcome, the writer affirmed that employers in want of hands would usually willingly advance money for their support, provided they were certain of the ability and good character of the men, and could rely upon their remaining at their employment sufficiently long to remunerate their employers for the trouble and expense incurred. He further recommended such a legislative change as would enable boards of guardians, under certain conditions, to migrate labourers who were dependent on the rates for support. One of these conditions was that notice should in all cases be sent to the Union into which the labourers were to be migrated.

FIRE-WARNINGS AND FOREWARNINGS.

London has narrowly escaped what might have been a terrible calamity; and thoughtfully and deliberately, after a careful inspection of the scene of the fire in Shoreditch, we assert this conclusion. Coincident almost, a series of fires has taken place east and west of the City; but amongst the number none present more remarkable features than does the one at Shoreditch. The locality of the calamity is rather low and thickly populated. The streets leading to it and adjoining are narrow, and very many of the houses in the vicinity date back a century and a half. Newcastle-street, as appears from a tablet inserted on one of the houses, dates from 1765; and Old Castle-street—the street where the fire broke out—presents at one end a series of gable-fronted houses, having all the appearance of being raised two hundred years ago. In the immediate vicinity of the timber-yard where the fire broke out, and ranging along Mount-street, the houses are modern, and wretchedly constructed.

The timber-yard was well stocked, as may be inferred even now from the charred *débris*, which rises several feet high. We have often noticed through the City a system pursued by timber-merchants and dealers in sawn timber, which we consider an evil. Many of these timber-yards are very narrow and confined, some of them hardly the breadth of an ordinary house. To compensate for frontage, the plan is resorted to of raising a framework of naked flooring and lofting. The timber is piled, and often it may be seen projecting several feet over the street, as well as rising several feet above the roofs of the houses. This is a common sight, and it may be seen in many back streets and low neighbourhoods. The facilities given to ignition by sparks from chimneys, where thinly sawn wood, almost veneers, are exposed, are apparent. In Shoreditch between twenty and thirty houses have suffered by the fire, the majority of which have been completely gutted of their doors, windows, floors, and roofs. We passed through most of the houses affected by the fire, and, were we drawing up an ordinary newspaper account, we might conjure up many a saddening picture of loss and destruction, of hair-breadth escapes from burning, of household gods, animate and inanimate, reduced to cinder. Birds, rabbits, poultry, and, in one instance, a sterner nature than Sterne's could be furnished with the sight of a poor man's dead donkey to moralise or weep over. The poor tenants of the six houses destroyed in New-street escaped with the exception of two, but lost their all,—their household effects, and their little stock-in-trade. It was lucky, indeed, that the fire did not take place some hours later. Had there been a strong wind the engines that were brought to play upon the fire would have been totally insufficient to stay the destruction. Another timber-yard was just the breadth of the street away from the one where the fire broke out. It narrowly escaped the conflagration; as it stood, it was slightly affected, but happily it was saved. Mild as the night was, portions of the burning mass were drifted a quarter of a mile distant, to High-street, Shoreditch, where the roof of a tavern was set on fire, and to which some of the engines engaged in putting out the first fire had to be draughted. House property, occupying a space of about 200 ft. square, has been injured, and the escape of more appears to us truly wonderful. The poor have lost their all; but it has been lucky indeed, considering the nature of the fire, and the remarkable manner in which it has worked destruction, that Shoreditch has not been completely gutted. The old half- and almost whole-timbered houses that line Bishopsgate-street, and intersect a large portion of Shoreditch and that quarter, are little better than so many powder-magazines or huge boxes of lucifers. Any one can prove the truth of our assertion if he will but visit the scene of the removals that are now going on in Bishopsgate and Shoreditch, to make room for the Great Eastern Railway Extension.

A more complete organisation of the Fire Brigade is wanted. If the City is left depending on a non-effective daytime service, we shall charitably add, May God help the City! There is no reason at all, except that of false economy, to prevent the City from having a complete and active embodiment of force for the daytime as well as the night. The loss of life and property in Liverpool-street is more or less owing to the want of men at the Fire Brigade Station. The help of the public, though acceptable at times, more often proves an incumbrance to disciplined men, who are so prevented from doing their duty. Let us impress it upon the minds of the citizens of London that the fire that was extinguished in the last days of September in Shoreditch, under more adverse circumstances might have swept, with an uncontrollable fury, over a large extent of the east of the City. Let us be warned in time.

THE LAST NEW THEATRE IN THE STRAND.

Observant passengers in the Strand will notice a frontage near the corner of Newcastle-street, marked as the "Opéra Comique," and, knowing the narrowness of the area between the Strand and Holywell-street, will find it difficult to imagine how, even in London, where now-a-days theatres are wedged in among the houses anyhow, an "Opéra Comique" can have been formed there. In truth, however, this doorway is but an approach to an underground way leading across Holywell-street, to a theatre which has been built between that and Wych-street, on a site still so small as to prevent anything like proper stage accommodation, but at any rate larger than was obtainable in the Strand. It backs on "The Globe," and is to a considerable extent underground, as will be understood when we mention that a long flight of stairs in Wych-street leads down to the stage level, and that the pit, of course, is lower than that.

The auditorium promises to be pretty enough, the painted decorations include a considerable amount of figure-painting, Apollo and the Muses, of course, figuring over the proscenium; but we must wait to see it further advanced before we offer any opinion upon its merits. The floor of the house, so to speak, looks as if it were intended wholly for stalls, and has a tier of boxes round it, with a slightly-raised level.

The name is altogether a mistake, unless the building is really intended for French comic operas. Even if it were put into English, it would be too restrictive, or would become absurd.

SETTLED CLAUSES OF CONTRACT.

During the last two years the council of the Institute of British Architects have been in communication with a committee of London builders on two subjects of great importance. 1st. As to "General conditions of contracts," which might be fair to builders as well as to employers. 2nd. As to the habit that some members of the profession had fallen into of having quantities taken out in their own offices, or by a surveyor nominated by themselves, and yet declining any responsibility as to the sufficiency of such quantities. After several meetings an agreement has been come to, which will be found in the following paper:—

"*General Heading for Clauses of Contract, as settled between the Council of the Royal Institute of British Architects and the Committee of the London Builders' Society.*

1. Contractor to provide everything necessary for works as per drawings and specification, or to the true intent and meaning thereof; and if drawings and specification differ, architect to decide which to be followed.

2. Contractor to conform to general acts, regulations, and bye-laws, relating to buildings; to give notices thereby required to be given to local authorities, and pay fees payable thereunder.

3. Contractor to set out works, to rectify errors, provide appliances, and to produce vouchers proving materials to be as described, and genuine, when required. The contractor to provide plant, labour, materials, &c., required. All materials and workmanship to be the best of their several kinds. To leave all perfect and clean.

4. Contractor to keep on ground a competent foreman; and to be supplied with a complete copy of drawings and specification, by the architect or measuring surveyor. Not to sublet without consent.

5. Architect to have at all times access to the works, which are to be entirely under his control. He may require contractor to dismiss any workmen incompetent or misconducting himself, and thereupon the contractor is to do so.

6. Contractor not to deviate from drawings or specification, or execute extra works, unless required to comply with the aforesaid acts and regulations or bye-laws, or unless upon authority of architect, to be shown by written order, or by plan or drawing expressly given and signed, or initialled, as extra or variation, or by subsequent written approval, signed or initialled. Vouchers for all such extras to be delivered to the architect or clerk of works weekly, in case of day-work. No day-work to be admissible unless so ordered, or for work impossible to be measured.

7. Alterations in or additions to works not to vitiate contract, and if no price be agreed, the value thereof to be added to or deducted from contract, according to schedule of prices or fair measure and value.

8. Work and materials brought on ground to be considered property of employer, when included in any paid certificate, and not to be removed without architect's consent; but employer not to be liable for loss or damage thereto.

9. Architect may require such materials to be removed as in his opinion are not according to specification, and others to be substituted; and, in case of delay, the employer may remove same, and substitute others at contractor's cost.

10. Architect may require work in his opinion executed with improper materials or defective workmanship to be re-executed; and, in case of delay, may cause same to be done at contractor's cost.

11. Faults arising from improper or defective workmanship or material within —— months after completion, to be made good by contractor; and, in case of default, employer may recover costs thereof from contractor.

12. Contractor to insure, in office to be approved, in joint names, in half amount of contract, until works covered in, and thenceforth in three-fourths until completion, and to produce policies and receipts for premium. Moneys received to be applied in rebuilding or reparation. In case of neglect, employer may insure, at contractor's cost.

13. Building to be under contractor's sole charge, who is to make good damage by fire, or from causes under his own control; and to hold employer harmless as to injuries to persons and structural damage to property.

14. Employer to have access to building, and may execute other works, for which contractor is to give reasonable facilities, so that his work be not impeded; contractor not to be responsible for damages to or occasioned by such other works.

15. Works (except painting and papering), to be completed in —— months after commencement, unless in case of inclement weather, causes not under the control of contractor, combination of workmen, strike, or lock-out affecting any building trade, in which case architect to extend time, and contractor to complete within such time as the architect shall consider reasonable and in writing appoint. In case of delay, employer to be entitled to £—— per week as damages, if architect shall in writing certify that works could have been reasonably completed in the time appointed.

16. If contractor become bankrupt, compound with or make assignment for benefit of creditors, or suspend or delay the works (except on account of causes mentioned in Clause 15, or on account of proceedings by parties interested in adjoining properties, or for want of proper instructions duly applied for), employer may require works to be proceeded with; and if requisitions be not complied with for —— days, may enter and com-

plete works,—the cost incurred to be repaid by the contractor.

17. Contractor to be paid, on certificate of architect, and at architect's discretion, during the progress of the works, as previously agreed, 80 per cent. of value of works executed, until balance of per centage equal 10 per cent. on contract sum, and thenceforth to be paid full value. When works completed or possession given up, contractor to be paid moiety of balance of moneys payable to him (except £—, for papering and painting), and the remainder —— months from completion of works or giving up possession.

Provided always that no final or other certificate shall cover or relieve the contractor from liability as defined in Clause 11, whether the same be noted at the time or subsequently to granting such certificate or order.

18. Certificate of architect or award of referee showing amount payable to contractor, to be evidence of completion, without prejudice to liability of contractor to make good defects as aforesaid. The sum reserved for painting and papering to be paid to contractor on completion thereof.

19. If employer make default for —— days in payment of any moneys due to contractor, or if works be delayed for —— months by proceedings of adjoining owners, contractor to be at liberty to suspend works, and require payment for works executed, materials wrought up, and loss on goods or materials purchased for the works, and not to be bound to complete contract.

20. Arbitration Clause: with regard to quantity or value of extras and omissions, or variations on the contract, and questions of delay, or the withholding of certificates, or the true intent and meaning of the drawings and specification as to cost,—the arbitrator being an architect and a Fellow of the Royal Institute of British Architects, agreed to by the parties, or appointed by the president (for the time being) of the Royal Institute of British Architects. The arbitrator to award costs between employer and contractor.

Memorandum.—In cases where the quantities are provided, it is recommended that, unless a surveyor be mutually agreed upon by the architect and builder, two surveyors be employed to take off the quantities, one appointed by the architect, and the other by the builder, at a meeting convened for the purpose."

THE NEW MECHANICS' INSTITUTE AN SCHOOL OF SCIENCE AND ART, KEIGHLEY.

This new institute and school, of the design of which, by the architects, Messrs. Lockwood & Mawson, we gave an engraved view and full details in our last volume, pp. 527-9, was formally opened last Friday with a distinguished gathering, and various musical and other ceremonies, followed on Saturday by a *soirée*, and on Monday by a concert.

The edifice is Gothic in style, built entirely of stone, with ashlar quoins and dressings. It stands at the angle formed by the Skipton-road and Cavendish-street, and is a conspicuous addition to the public buildings of the town. The estimated cost was 12,000*l*. The institution is designed as an industrial college for the Keighley district. The building is a very complete one for its purpose, and the educational scheme of the promoters has developed into a still more practical shape since we described its details. The Endowed Schools Commission, on making their inquiry at Keighley in reference to the reorganisation of the grammar-school, were so impressed with the arrangements and general scheme that they decided to turn the grammar-school into a girls' school; hand over the teaching of boys to the new trade-school; and hand over also one-half of the grammar-school income, to be appropriated in the form of scholarships and in other ways that will increase the efficiency of the trade-school. The grammar-school income is but small, and for some time from 100*l*. to 150*l*. a year is as much as can be expected from it; but the arrangement seems a good one.

Of the edifice as built we may give some description. The architectural arrangement has been made subservient to the requirements necessary to unite the large public lecture-hall and the smaller rooms of the Mechanics' Institute. In the grouping of the elevations, advantage has been taken of the different heights and forms of the rooms to produce externally a picturesque effect. The principal front, towards Skipton-road has seven large pointed windows opening into the great lecture-hall. The main entrance is under the tower, which rises to a height of nearly 100 ft., and serves to unite and yet to distinguish the double block of buildings. The Cavendish-street front has gables at each end, with traceried windows and a range of pointed windows between. The centre of this front is relieved by an octagon window terminated by a projecting roof. On the ground or principal floor the institute has the more important rooms, consisting of a reading-room, 28 ft. by 18 ft.; conversation-room 18 ft. by 17 ft.; library, 33 ft. by 18 ft.; news-room at the south-west angle of the building, 33 ft. by 20 ft.; also bank-room, secretary's office, and committee-room. The lecture-hall is 87 ft. by 44 ft. and with a wagon-headed and panelled and boarded ceiling, and will be common both to the institute and school of art. It will seat about 700 persons. On the upper floor the school of art has an exhibition-room, 46 ft. by 22 ft.; mechanical-room, 32 ft. by 22 ft.; painting-room, 30 ft. by 18 ft.; elementary drawing-room, 40 ft. by 18 ft.; also masters' room, ladies' room, and retiring-rooms and lavatories for each sex. The lighting of the painting-room is from the north, and of the exhibition-room from the top. A gallery opens out into the lecture-hall from the landing of the principal staircase, giving accommodation for about 100 persons. The whole of the basement story (which, from the nature of the ground, is clear on all sides) is occupied by a range of class-rooms, eight in number, including one 50 ft. and 18 ft.; a lecture-theatre, 28 ft. by 18 ft.; and a residence for the hall-keeper. Separate entrances from this story are provided. The building is so arranged that the mechanics' institute, the school of art, and the lecture-hall may be in operation at the same time, and yet not interfere with each other. All the rooms are lofty and well ventilated, and are warmed with open fires or hot-water apparatus. The works have been executed by the following tradesmen:—Mr. John Smith, the masonry; Mr. R. Sugden, the joiner's work; Mr. John Schofield, the plumbing and glazing; Mr. B. Dixon, the plastering; Messrs. Clapham, Bros., the ironwork; Mr. T. Wilson, the slating; and Mr. H. Briggs, the painting. The original amount of the contracts was 9,434*l*. 3s. 6d., and including the price of land, the architects' commission, &c., the total cost will be about 13,000*l*.

ARCHES UNDER PUBLIC WAYS.

Sir,—Admitting the dubious language of the "Act of Parliament,"—*lapsus calami*,—I think there can be no doubt as to the intention of the Legislature that this was a special fee of 10s. per arch; in fact, it involves a manifest absurdity to assume any other intention, as each arch is a complete structure or building in itself, and I fancy it really cannot be argued that an indefinite number of arches may be erected for 10s., and at the same time that the fee for one is 10s. —a distinct *non sequitur*. Again, it can hardly be deemed an excessive fee. The lowest fee under the Act for any building or structure, descending to a W.C., is 15s. If built as an office-building at the back of a house, as a coal-house, this is the fee to which it would be liable.

A District Surveyor.

THE NEW YORKSHIRE CLUB, YORK.

For two years past a new house has been in course of erection for the Yorkshire Club, near Lendal Bridge, in York. The new structure, which was opened for the accommodation of the members of the club on Tuesday in last week, is a large one. The edifice has been erected in accordance with the drawings and designs of Mr. C. J. Parnell, of London, architect. The architecture is Elizabethan. The portal is supported by polished Aberdeen granite columns, and the building is approached by a flight of steps. The ceiling is lighted by glass domes. The principal hall is of large dimensions, and contains the cloak-room, porter's screen, and the principal staircase, the landings of which are supported by arches and columns. On the ground floor are the dining-room, morning-room, smoking-room, and billiard-room, with lavatories. The staircase leads to the private dining-room, drawing-room, library, and writing-room, with a suitable number of dressing and bath rooms. The serving-room on each floor is supplied with a lift from the cooking kitchen. The superintendence of the building devolved upon Mr. W. Lewis, the clerk of the works during the erection of the club-house, but who is now following the profession of an architect. The contractors were Messrs. Weatherley & Rymer, builders, of this city; and the painting and decorations were executed by Mr. Perfect. Mr. Prudames supplied the gasfittings; the globe ventilating light was by Hammond, of London. The carving was executed by Mr. Ruddock, of London. The plumbers were Messrs. Hodgson; the plasterer, Mr. Rawling; and the bellhanger, Mr. Tryer. Mr. Sanderson supplied the ironmongery furnishing. The kitchen was fitted up by Mr. W. Walker, iron-founder, Walmgate. The principal rooms, which are of large size, have been furnished by Messrs. Howard & Son, of London.

THE DESTROYED CRYPT, LEADENHALL-STREET.

Previous volumes of this journal contain views of the few ancient crypts that are to be found, or were to be found, not long ago, in London, and we have thought it desirable to add to them an illustration of the crypt recently destroyed in the City, from a rough sketch made not long before this occurred. This interesting relic of Old London was situated at the south-east corner of Leadenhall-street, near to the well-known Aldgate pump, and, as some of our readers will remember, was periodically "discovered" by writers in the newspapers and described. The shop, to which it formed the basement, has been removed to increase the width of the approaches here, and the desired level of the new pathway and road was thought to render necessary the destruction of the vaulting. It seems to us regrettable that some other course was not adopted, so that it might have been preserved,—at any rate, in part.

Little is known of its history. In plan the crypt was a parallelogram, being 46 ft. from north to south, by 17 ft. east and west. It was divided into two aisles, as shown in the view, by clustered columns, from the caps of which sprang the vaulting. At the intersections of the groins were bosses, cleverly executed. The arched vaulting was received against the walls on semi-clusters, corresponding with the centre groups. The bases of the columns were about 10 ft. below the surface seen in the view. The opening with the steps led from the street, but the archway on the right communicated with the upper floor by means of a circular staircase. There were large cellars near, but not of the same period.

PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.

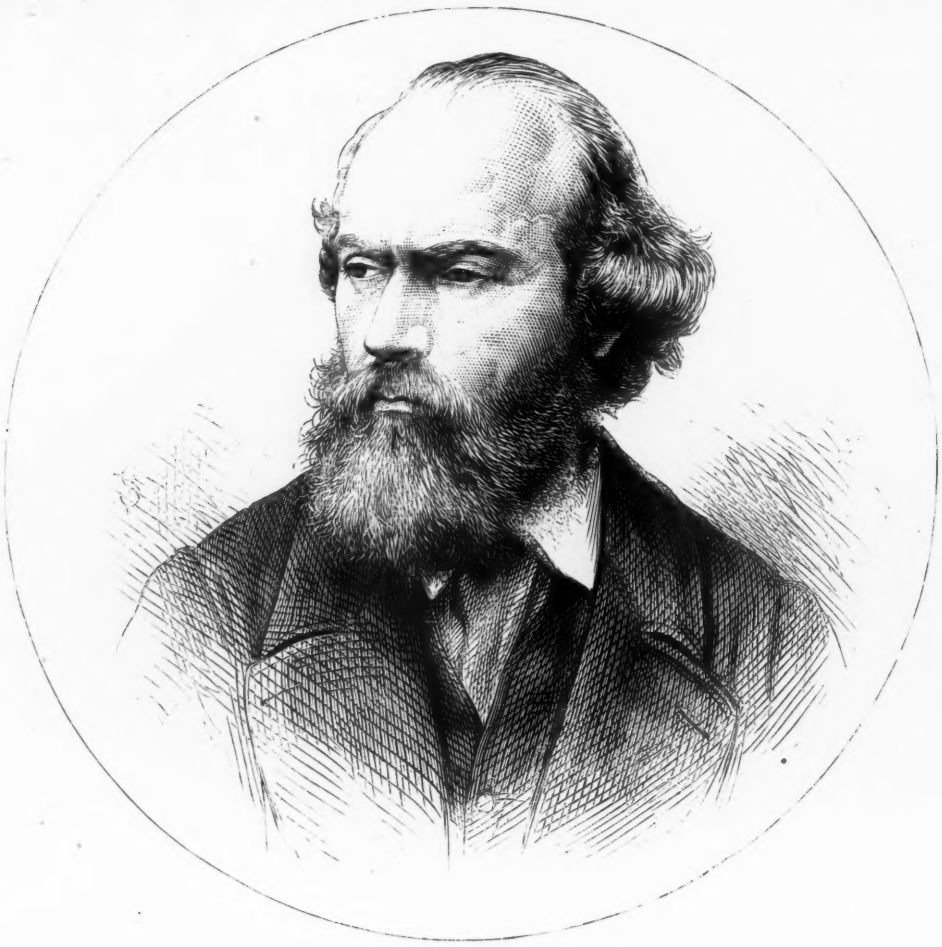
On the anniversary of the declaration of the independence of Greece this year, King George announced his intention to erect a monument to commemorate the event in the Square of Concord, at Athens. And he charged Mr. Ziller, the architect of the Academy, to prepare a design for carrying into effect the project of a monument which his Majesty had formed. This design we now publish.

The principal figure on the summit of the monument represents Hellas. The four seated figures on the base represent the four territorial divisions of the Hellenic kingdom,—Northern Greece, Peloponessus, the Archipelago, and the Ionian Islands. The circular frieze round the base is composed of the most memorable scenes of the history of Greek independence. Among these representations are,—Germanos, the archbishop of Patras, raising and blessing the standard of independence on the 25th of March (6th of April), 1821; the siege of Mesolonghi, the battle of Navarino, the arrival of Capodistrias, and the landing of King Otho.

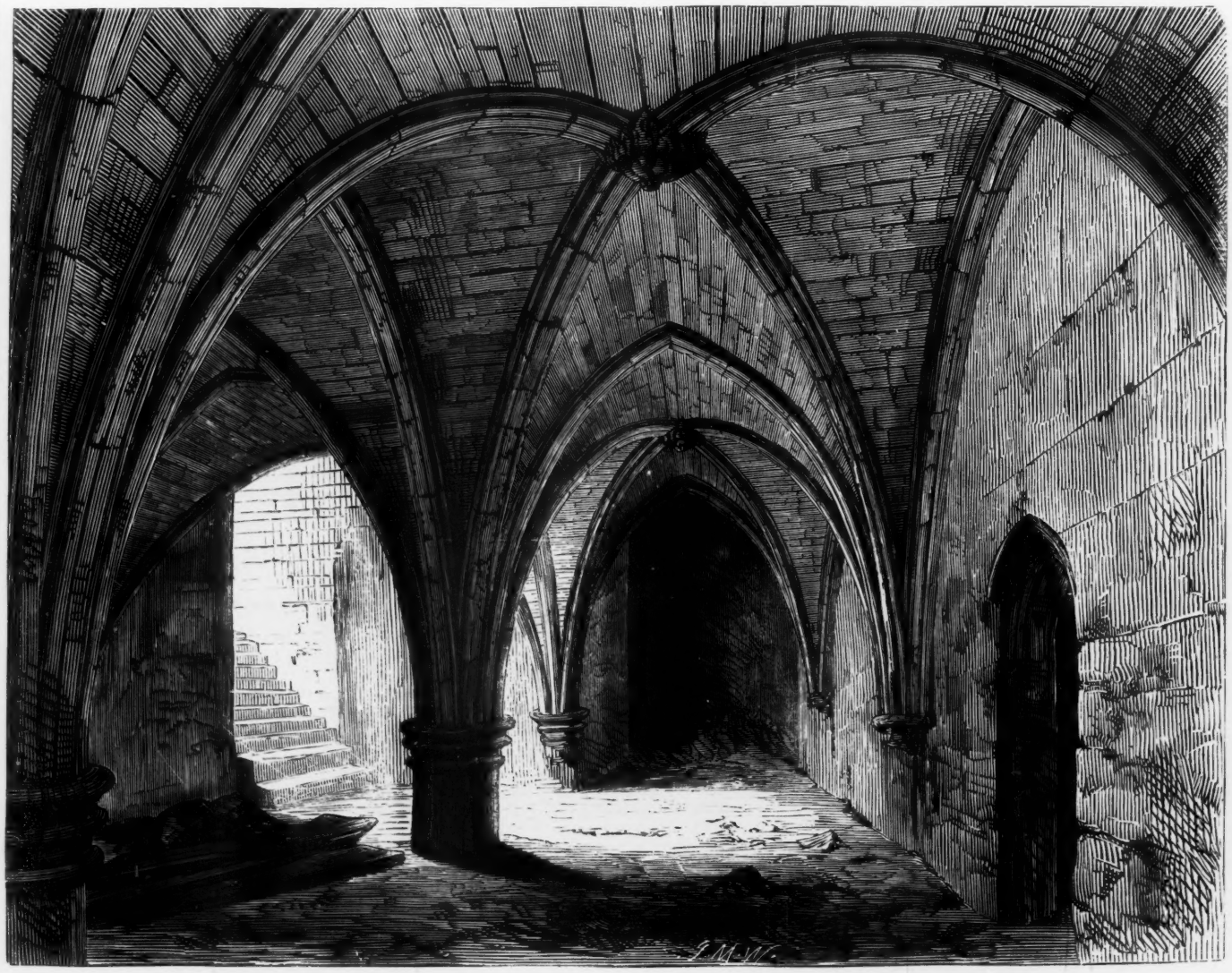
Two inscriptions are placed on the column. "The Nation to its Liberators." "Union gives Strength." The monument will be of pure Pentelic marble, 60 ft. high, occupying a commanding position, visible from the six principal streets of Athens, and at the termination of that which runs in a straight line from the Piræus.

The foundation-stone will be laid next year on the fiftieth anniversary of Greek independence. Invitations will be sent to the Greeks in every part of the world to attend the ceremony, which, it is hoped, will inaugurate a period of future progress as well as commemorate past glory.

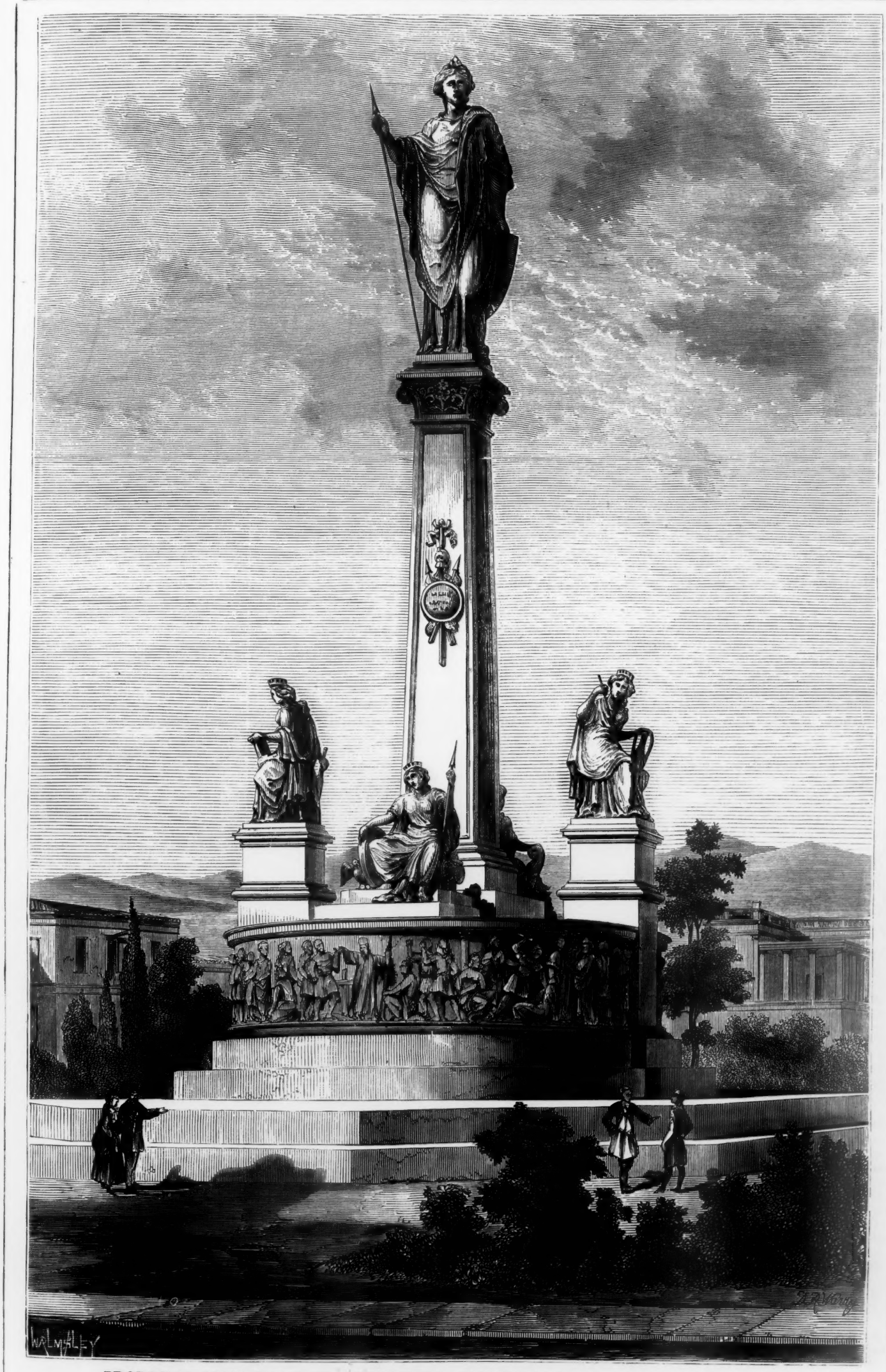
The monument is to be raised by subscription, and subscriptions will be received by all the Greek consuls.



MR. CUYPERS, *Architect of many Churches in Holland.*



THE DESTROYED CRYPT, LEADENHALL STREET, LONDON.



PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.

Mr. Ziller, Architect.

STRASBOURG.

HONNEUR AUX SUISSES!

The horrors of the assault are over. To those only who have experienced the existence in a besieged city can the realisation of the miseries endured be possible. We have listened long to the painful repeatedly-told account from the lips of those who escaped when once escape became practicable, after the commencement of the bombardment that inaugurated the *fête* of Napoleon, of the first sound of missiles whizzing over their heads, like the ascent of rockets,—a whisper compared with the sound that followed of the monster bombshells bursting on roofs, shivering the slates and timbers for 4 ft. in circumference into splinters no larger than lucifer-matches, tearing away in their descent one side of the wall of an apartment, and igniting all around on their landing on the ground. Then came the resorting to the cellars of their houses, carrying their all that was valuable or transportable, barricading every window with beds to dull the din without and protect themselves from the chance balls that might reach them, the staircase forming the only means of ventilation and egress of smoke. Here they awaited some means of rescue or escape from the doomed city. Then, when the increasing fire began at midnight, made doubly awful by the darkness, and the poor sufferers felt as if translated to the infernal regions, escape, at all risks, alone occupied their thoughts. Some few French families accomplished this, with the Germans leaving the town. Their proximity to the German frontier, and the hitherto amicable intercourse between the two people, in this city had almost necessitated the free use of the German language. Hence their escape as Prussians. But the helpless, the aged, the women, and children, these were still left, their lives momentarily endangered, and the prospect of famine before them.

It has been to the Swiss that their deliverance has been due. All honour to the kind-hearted little Republic! A deputation from Zurich, Basle, and Berne petitioned the Prussian and French Governments for permission to enter the city and offer gratuitous hospitality to all who would accept it. And convoys of Strasbourgeois were brought into the principal towns of Switzerland, there to receive unbounded care and kindness. The contributions from every canton have been very large, more than 100,000 francs already subscribed, independent of offers of every kind of hospitality. Not more than 2,000 profited by this generous offer. Many of the most needy remained, preferring at all hazards to cling to their little all, in hopes of saving it at the end, rather than leave it to the invaders; others in hopes of gain when chance of pillage came. The Jews also appear to have remained in their quarter. The accounts of the ruined and battered state of the houses as given by one of the Swiss committee, who entered to escort the refugees, is very heartrending. The sympathy of the Swiss nation for the Strasbourgeois has existed for many a long year. In 1255, they were both Imperial cities, members of the Rhenish League. Their old friendship was renewed in 1456, at a somewhat original trial of skill of archery performed from boats, on the rivers Limmat, Aar, and Rhine. On this occasion the Zurichers, to express the promptitude with which they would come to the help of their friends the Strasbourgeois should they ever need their aid, presented the latter with an iron pot of soup, still hot, that had been cooked at Zurich. The "Marmite" was placed with great ceremony in the Bibliothèque of the town; and, may be, it may still be found intact among the precious embers, a type of indestructible friendship.

In 1530 the towns of Zurich, Berne, and Basle again joined with Strasbourg to protect their Protestantism, in alliance with the Elector of Hesse. In the religious wars of Switzerland in 1529, Strasbourg mediated between the belligerent Catholics and Protestants, and one of the conditions of peace enforced in 1531 was the renunciation of the friendship of the Zurichers and Strasbourgeois.

The good understanding was renewed between the two cities in 1576, by a repetition of the presentation of the "Marmite." In 1584 Zurich and Berne made an alliance, offensive and defensive, with Strasbourg against its bishop. In return, the latter citizens fought bravely with the Swiss in the Burgundian wars, and in the battles of Nancy and Morat. In 1681, when Louis XIV. surprised and annexed the city to France, the Swiss, powerless to aid their friends by arming, strove to aid her by mediation. The custom of international fêtes has continued, and happily been substituted for manifesting the friendly feeling between the two people. But two years since, a miniature copy of the "Marmite" in enamel and gold was presented by the Zurichers to the Museum of Strasbourg. Basle also had received aid in her hour of need from the now distressed city. In 1356 the former had been almost entirely destroyed by an earthquake. The latter not only offered hospitality to the houseless, but gave them still more tangible help by calling on their neighbours of Fribourg, Colmar, and Mulhouse, to aid them in rebuilding the fallen city.

Amid the accumulated horrors of war, this little sketch of enduring kindly feeling and practical tangible friendship between two peoples,—the one reduced by the treachery and incapacity of their rulers to the depths of misery, left alone to struggle through hopeless abasement; the other, peaceful, simple, kindly, coming to their aid, vying with each other in proffers of open-hearted hospitality and sympathy,—may tend further to exhibit the merits and sterling worth of the Swiss.

Lausanne.

OPENING OF THE NEW REREDOS AT HORNCASTLE.

Another of the works lately done in the parish church of Horncastle has been completed, and was unveiled at the Harvest Thanksgiving services. The screen is in Caen stone. It was designed by Mr. C. Giles, of London; and sculptured by Mr. J. Forsyth, also of London. It is in the Perpendicular style of architecture, but of so free a character as to harmonise with the decorated east window. There are five niches; the centre one filled with a representation of Our Lord's Agony in the Garden, the Saviour being accompanied by two angels in *mezzo relievo*, one bearing the symbolic cup, the other ready to place a crown on our Lord's head; over this niche is a canopy ornamented, the whole being surmounted with a cross. The other niches are filled with effigies of the four Evangelists, and between the canopies over them rise enriched pinnacles. Pillars of polished marble of various colours uphold the canopies, and beneath are panels filled with diaper work consisting of escutcheons. We believe it is intended to have the sculpture tinted at some future time.

WEAKNESSES IN THE SEMI-DETACHED VILLA.

Sir,—Is the improvement in the arrangements of the semi-detached villa beyond the resources of architecture? The question arose during a stay in one of the villas near London: villa and suburb both typical. I visited numbers of these erections, and, with the exception of a few details, the arrangements were identical. Judging from the class who live in these villas, and from the frequent adverse criticism on them in current literature, one would conclude that better plans would be appreciated, and, what is of more account to the builders, would *pay*. An infinity of ingenuity has been bestowed on labourers' cottages, while none appears to have been bestowed on small villas, notwithstanding there has been so much demand for it. The villa that has caused these remarks, and which appears to be a type of its class, has a frontage of 25 ft. What is called the ground-floor is more nearly the first floor, being generally about 6 ft. above the ground line; the front and garden steps causing much work, and being dangerous for children. There are generally eight rooms, two on each floor. For this sized house, two reception-rooms, of about 260 ft. superficial, ought to be sufficient accommodation, but we have instead two rooms on this floor of about 12 ft. square. It is true there is generally a small room in the basement called a breakfast-room, but the proportion of three reception-rooms and four bedrooms appears absurd, resulting in there not being *one* reception-room of convenient size. The reason for this is evident, the designers having too much room in the basement for the kitchen and its offices, evade difficulty by calling the spare space they do not know what to do with in the basement "a breakfast-room." In practice I find that plans, that show places where "nice cupboards" can be put, are deficient in compactness. The back garden, usually already small enough, is further filled up at the back with coal-cellars, dust-bin, &c. There ought to be no such depressing objects visible from the back windows, but the garden should come quite up to the back wall of the house. The W.C. is generally placed prominently in the thoroughfare from the living-rooms to the kitchen, and the servants' W.C. is sure to be a nuisance. The pantry is placed anywhere, and without thought as to convenience. The sanitary arrangements are generally of the obscurest.

These are a few of the defects of these dwellings; perhaps if you gave prominence to them in your journal, it might be the means of eliciting some valuable suggestions for their improvement.

Inquirer.

SASHES.

Sir,—I am glad to see that this subject is attracting a little attention. The idea of Mr. Ambrose seems to me to be too complicated, and too expensive for general use; and the inconveniences of the present system suggested by "M. H." are similar to what I pointed out in my letter of the 3rd ult. He needs not wonder why we do not adopt French casements. I have used a good number of them, and I consider them to be equally as troublesome as the ordinary sashes, and quite as liable to let in the wet and draught. The most useful place for them is for ingress and egress from a back parlour to a conservatory or garden of a villa residence. As "G. L." seemed anxious to know the system I would adopt to obviate the inconveniences of the present mode, I will now put it in this form. Supposing a good practical carpenter and joiner should be out of work, or have spare time on his hands (which many have had of late), and who may have saved a few pounds when the trade was brisk, a few years ago, by being a very steady and careful man: he does not like that his time should be utterly lost; so he determines within himself to make a few doors, and sashes, and frames for sale; or he may have the idea at some future time of building a house for himself. He starts making his sashes and frames on the system now in general use,—double-hung sashes, with balance-weights,—and having a pride in making his own, being bound to no order or specification, and knowing the difficulties he has had, or has seen others have, in hanging sashes (in some cases in having to take out the parting slips, to make room for the weights; in others floor-brads or 2½-in. nails frequently driven into the middle of the linings right in the way of the weights by labourers, in nailing up sacks or hair-bags, to keep out the wind, rain, or frost). These little difficulties he will try and prevent as much as possible. He will take care to give sufficient room to allow his weights free play. It may enter his mind, if he is making them for his own use, "Why need I have any weights?" Various plans may revolve in his mind how they may be hung without them; but all are more or less complicated; and then he thinks there is no necessity for any of these complications. "My sashes," he says to himself, "are of equal size and weight, with the trifling exception of the extra depth of the bottom rail, and as for that, the slight friction will prevent that from being any obstacle. I will make my sashes *suspend each other*; there is no occasion to alter them, and I can also make my frames do; so that I shall get rid of all the little difficulties, without any complications; and as I have observed, when I have been out looking at the various styles of buildings, in about nine cases out of ten the bottom sashes only are opened, the top ones being closed even in bedrooms, so that the foul air is retained in the room, and as I wish to preserve my own health, and also that of my wife and family,—I will hang my sashes on this principle; so that the top sash must be opened the same time as the lower one, so as to get as good ventilation as possible."

I have worked out this idea, and hung my sashes with chains, so that the inconvenience of the weights and broken lines, and of the lines being detached from the weights, is at once disposed of, and it is an excellent system where the top sash is out of reach. The sashes are prepared in the usual way, with holes bored for the lines and knots, in which I insert small bolts with nuts, which screw at the bottom, and hooks to the chain so that they can be regulated to a nicety, and are easily unhooked and removed when required; but although I can hang them almost to a shaving, I prefer a head on the sill and a groove in the bottom rail to fit on it, to prevent heavy driving rain from drifting in, as I have seen it bubbling up between the bottom rail and the inner bead, and running down the wall.

Since I first wrote to you on this subject, I have, during my search after improvements in sliding sash windows, come across one in the Museum of Patents, South Kensington, patented by a Mr. Bullivant, which coincides very nearly with "G. L.'s" idea. It is simple and neat in appearance, and possesses many advantages: dust, draft, and rain are effectually excluded, when closed or open; its construction is such that it cannot be shaken by the wind; it is of even pressure, the contraction and expansion of materials being overcome so that the sashes never require easing, and any unskilled person can remove them for cleaning or any other purpose.

A Working Man.

HER MAJESTY'S OFFICE OF WORKS.

Sir,—I do not blame you for the moderate tone used by you in speaking of recent doings by this department. I know as well as you the exigencies and responsibilities of office, and that men in authority should not hastily be condemned. I think, however, that you have been led by the hasty view you say you had of the Government Terms for architects to take rather too favourable a view of them. They provide that *no rules of the Institute* shall be recognised by the Government,—a wanton and unnecessary insult, which surely the profession ought not quietly to stand. Then the architect is to name the day of completion of the building, which seems to me out of the question. This would be to undertake a builder's risk without a builder's profit. Then the arbitration clause is, as you have pointed out, altogether one-sided. There is nothing to prevent the Treasury from appointing Captain Galton or Mr. Hunt arbitrators in a dispute of their own raising. To show that the latter knows how to take care of his own profession, the surveyors' charges for the new Home and Colonial Offices exceed 6,000*l.*! or 2½ per cent. on the estimate, to be paid out of the first certificate to the surveyors, one of whom is Mr. Hunt's son, who early canvassed the builders, and so was able to get the appointment.* What a satire it is that surveyors should get in cash, and at once, for a few weeks'—say even a few months'—clerical labour, half as much as an architect for his designs, superintendence, and anxieties over several years.

A Tax-Payer.

THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

Sir,—The apparently semi-official communication in yours of the 17th ult., announcing that the law officers of the Crown had declared these drawings to be the property of the Government, and that Mr. Barry would give them up unless supported by the Institute in resisting, deserves serious and immediate consideration. So far as resolutions can go, the Institute has already done enough, and it only now remains at once to open a guarantee or indemnity fund, to which I for one will gladly subscribe, in order that this important question may not be surrendered without, at any rate, a proper and constitutional trial.

I regret very much to notice the pusillanimous and desponding tone of the communication above referred to; and with a view to show that the case is not really so bad as would appear from it, allow me to draw attention to the following considerations:—

The law officers of the Crown are, doubtless, able men, but their opinion is worth little or nothing on this question, formed as it must have been on an *ex parte* statement submitted to them by the Department of Works. Who ever acts on the opinion of an adversary's lawyers? The present Chief Baron, in charging on the recent case, Ebdy *v.* McGowan, carefully refrained from offering any opinion on this question, and in that showed his wisdom, as it would require very full evidence on professional usage to enable him to form one. I doubt very much whether, if we were permitted to see the opinion of these law officers, it would not be found to be encumbered with so many "ifs," as to make it a mere *brutum fulmen*, wherewith to terrify Mr. Barry and the profession into submission. At any rate, let Mr. Barry's case be properly stated, and laid before two eminent lawyers, of at least equal standing to the aforesaid law officers, and I confidently anticipate an opinion will be given far more clear and decided in his favour than anything that has yet been given against him.

Unless there be something very peculiar and exceptional in the contract between the late Sir Charles Barry and his employers, the question at issue is not one of law at all, but of professional usage, on which the collective opinion of the Institute is of far more value than that of any lawyers, however able. It will have to be left to a jury, and I question much but that the sympathies of such a body are far more likely to be with the architect than with the Government, who must assume the position of plaintiffs, and whose conduct in this whole business is not likely to commend itself to the English love of justice and fair play.

As for its being Mr. Barry's interest to surrender his rights rather than quarrel with a Government from whom he may have to look for future employment, if this principle is to hold good, he may as well work for 4, 3, or 2 per cent. instead of five for the same reason. I believe, however, an architect who knows and maintains his proper professional rights is far more likely to command respect and confidence from either Governments or individuals, than one who is ready to waive them in order to gain further employment. How often do we find lawyers distinguished by the integrity, ability, and success with which they have opposed Governments, selected just on account of this to hold Government offices. Moreover, no one can tell how long the present Government will remain in power, and the present Commissioner of Works does not seem to be so popular either with the public or his colleagues that any cowardly concessions should be made to gain favour with him.

There is one consideration worth notice, and, if it be a valid one, it at once furnishes a complete answer to any action that may be taken by the Government against Mr. Barry, *i.e.*, does not the Statute of Limitations deprive the Government of any right of action to recover any drawings prepared more than six years back? Not being a lawyer, I cannot speak with absolute certainty on this point, but a legal friend advises me that it is so. The late Sir Charles Barry is now dead more than six years, he always considered these drawings as his property, and bequeathed them by his will. The Department of Works put in no claim to them until nearly ten years after, and, therefore, it looks very likely that they are now too late, and that Mr. Barry has simply to plead the Statute of Limitations to silence any action they may threaten him with.

F. R. I. B. A.

* The accepted tender is that of—
Jackson & Shaw £242,323 0 0

ELECTRIC WARFARE.

Sir,—I remember a lecturer informing his audience that he could produce enough electricity to kill them all. A milder dose would only paralyse. This has been tested on whales, and they approve (no,—the whalers approve) of it; capture is made easy.

Now, Sir, let us adapt it to stay annihilating warfare. When a ship approaches bent on mischief, let the enemy have a Congreve rocket, with negative and positive wires entwined. Unless the ship is made of a non-conducting material, glass, porcelain, &c., the effect would be certain. Thus, by getting them in a line, we should catch them all alive O! As to forts and fortresses (masculine and feminine, I presume?), why wire into them for the like result?

R. T.

MAN THE BOATS.

Sir,—A portion of my last letter, not printed, because considered unintelligible without diagrams, can perhaps be understood by being explained as follows.

Suppose a block to have six angles and six sheaves; two small ones at one end, and just far enough apart, *i.e.*, their edges, to allow two ropes to pass between them without chafing; then suppose at, say, 8 in. or 10 in. there should be another pair of sheaves, but placed nearer together; so that the two ropes before mentioned could not pass between this pair, but must be placed on their outer edges or grooves (this will separate them); then if, at the other end of the block, a pair of sheaves were placed similarly to the first pair, or so that the ropes could pass between them; then if the ropes were hauled on, they would, in running through this block, be compelled to bear very hard on the centre pair of pulleys (because of their forcing the ropes apart, and consequently out of a straight line). Now, if we could make either one of this centre pair of pulleys always turn its fellow pulley (or sheave) at the same rate that it moves, then when one rope (or fall) should be running over one of these sheaves, the other rope would by the other centre sheave be forced to run at the same rate, and if they were the falls of a boat, then one could not run out faster than the other.

To effect this, make the centre sheaves large in diameter (to increase their power), and screw on to the side of each one a solid iron-toothed wheel; then these two wheels will work into each other, and thus cause the two centre sheaves to move or turn each other, which fully effects our object. The toothed wheels can have places cut out for them in the inside of the shell of the block.

Then in using this as (what I should call a paying-out block) in lowering the boat, it should be hooked by a strap to the bottom of the boat, till the latter has taken the water; then, by using this with the last-mentioned apparatus for casting off the two lower blocks of the tackles, the boat could be lowered almost by the self-action of the said apparatus.

Henry Ambrose.

MARGATE AND ITS CESSPOOLS.

How often have we in this journal spoken deprecatingly of the evils of the cesspool system at Margate; and with how little attention have our warnings been heard. The borough surveyor of that popular watering-place says, in a late report presented to the Town Council upon the subject, "the site of the town is perfectly riddled with cesspools;" and so it is, and we had feared that only on the outbreak of some frightful epidemic, and then with hot and imprudent haste, would the local sanitary authorities consider their ways and be wise. It appears, however, that guided by the intelligence and energy of a local medical man, who has for many years been an ardent sanitary reformer, and who has lately been created an alderman of the borough, Margate is about to awaken from her lethargy upon this most important subject, and to betake herself to "wise counsels" before the question is forced upon her in a manner that admits of no debating; for at a late meeting of the local Board it was resolved that Mr. Bazalgette should be called in to advise with them upon the general question of drainage, with a view to the prompt adoption of such a scheme as may be considered best.

We commend the wisdom of the local Board in procuring the best advice they can get, and we hope that a matter in which Margate can in no way afford to try experiments or make mistakes, may be undertaken with a careful temerity that is entirely opposed to hasty or indiscreet action. The death-rate of the borough, even including the many invalids and the patients of the infirmaries, is only some 13 or 14 per 1,000, notwithstanding all the evils existing. The atmosphere of Margate is remarkably dry, the average rainfall being only just a little above 20 in.; while that of Malvern is 30 in.; Hythe, 32 in.; Sevenoaks, 34 in.; Hastings, 29 in.; and so on.

Margate stands well. Let her rulers look to it that no hesitation to grapple with the important question now before them may place an impediment in the way of her future progress.

COMPETITION.

Matlock.—Designs for restoring the church having been sent in by several architects, Mr. Blomfield, architect, was called in, and reported in favour of the design sent by Mr. B. Wilson, architect, Derwent-chambers, Derby. The other architects competing were Messrs. Wilson & Oldham, Manchester; Mr. Hull, Northampton; and Messrs. Hine & Son, Nottingham.

THE HOLYHEAD BREAKWATER.

This undertaking, which has been in progress for nearly twenty years, is at last in a fair way towards completion. A number of men, amounting to about 200, are now engaged, and are under the orders of Mr. W. Williams, Tanyrefail, the supervisor of the works. The heaps of red sandstone which used formerly to stand untouched at Soldier's Point, have entirely disappeared, and a great call for more is made. The quarries at Holyhead Mountain also resound with the sound of blasting, and stones weighing ten tons and upwards are dislodged at a single blast. The lighthouse at the end has been started, and the work is at present about 6 ft. above the level of the sea. The foundation upon which the lighthouse is to be built, is round on the north and south sides, to the extent of 30 ft. at each end, but goes off square on the east side, where it is 70 ft., confronting the Isle of Anglesey. The lighthouse proper is to be octagonal in shape, but is not to reach to any great height, as it is merely intended to guide vessels entering the harbour. We believe no provision is to be made for the permanent residence of the two light-keepers, as there is no danger of their being kept long at their posts. The stones composing the foundations are hard Anglesey stones, and are embedded in one another with concrete cement. Cement, however, is not the only way in which they are fixed from one stone to another, thus preventing them from shifting. An immense crane, worked by a circular engine, is the means by which these stones, many of them weighing five tons, are placed in their destined position. There is also a number of men employed in shovelling the smaller pieces of stone into large receptacles for the purpose, which are raised by a crane, and deposited on the outer side of the breakwater for the purpose of diminishing the force of the sea. A new steam crane has been erected, and a short line of railway runs into the sea, along which go the wagons laden with the weightier lumps of stone for the embankment or backing, which is to extend about twenty or thirty yards, and is intended to shelter the lighthouse from the greatest violence of the north winds. The extreme length of the wall is about 1½ mile, and a fine prospect of the Irish Sea is obtained from it. The work is expected to be finished in about two years.

THE INDIAN PUBLIC WORKS DEPARTMENT AND THE CIVIL ENGINEERS IN IT.

Sir,—I had occasion to write to you some time ago, to announce the safe delivery (after a protracted labour) of the mountain (representing the heads of the Public Works Department) of a healthy, though diminutive mouse. I have now to announce a similar occurrence; but, unfortunately, this time the interesting progeny is stillborn.

No sooner had the Institution of Civil Engineers resented the cowardly affront offered to the profession at large by the Indian Government, than the latter issued a circular, informing us all that the whole thing was a mistake, and that so far from underrating the civilians in the Department, Government intended shortly to

place them all on an improved footing, and to make their emoluments, &c., in every way equal to those of the military *employés*. It did not, it is true, endeavour to explain how the former elaborate proofs that the civilians were so much better off had been found wanting. The scheme consisted in raising the pay 60*l.* a year, and making this increased pay the salary of all engineers alike, civil and military, always excepting, of course, the engineer officers, who having the making of the rules, and being liable to be called out for military duty (when, if I am rightly informed, they are allowed to retain their appointments), are to receive an extra allowance as a "retaining fee." The *Pioneer* newspaper, well known to be the Government organ in Upper India, definitely announced that the next *Gazette* was to contain this panacea for all civil grievances: this was in May last, but up to this date not another word has been said about it. To make matters worse, and probably with a view of rendering civil members of the Department still more discontented, some of those who were since last October posted to railways (the new State ones) were granted the increased rate of pay, while it is in contemplation only to apply it to the others from the 1st of April last, and it is now apparently being postponed to save the extra salaries under the pretext of financial pressure. The real probable cause is (and I have heard it from more than one source) that the old colonels and majors in the staff corps, who, after some twenty years' service, find themselves still relatively low down among the executive engineers, have been exercising pressure upon the Indian Government to delay the promulgation of the new rules, as directly they come into force these gentlemen (who draw nearly double the pay of civilians doing the same work) will be practically debarred from all pecuniary promotion.

VOX IN SICCO.

Allahabad.

MONUMENTAL.

Trowbridge Cemetery.—This cemetery contains two new funeral monuments, now near upon completion. One is a mausoleum containing the remains of the late rector and the members of the Kingston family. This building, which is of a semicircular shape, is composed of Box ground stone, and is in the Norman style. The walls are 5 ft. 6 in. in thickness. The exterior is ornamented by zig-zag moulding, supported by polished granite columns with carved caps, with recesses on either side between the columns for mural tablets. The interior is arranged for the reception of eight coffins. The marble slabs in the several chambers at present contain four, that of the late rector and three of the Kingston family. The whole is enclosed by iron rods, supported by pillars of Hanham stone, the interior being approached by steps of the same material. The raised mound is planted with evergreen shrubs. A little distance from this stands another mausoleum, of rectangular shape, in the Early English style, erected by Mr. Rowland Rodway, in which the remains of his son are placed. The exterior is embellished with statues emblematic of Faith and Hope, placed over the entrance, the spandrel being reserved for a figure of the Saviour holding a globe in his hand, with the inscription, "I am the resurrection and the life." Over the doors, which are of oak, ornamented by wrought-iron hinges, run the words, "Hid with Christ in God," carved in stone. Zig-zag moulding runs round the front and sides of the building, the front being supported by pillars of polished Aberdeen granite, with carved caps. The interior is arranged for six coffins, on tables of encaustic tiles. The floors are of the same material, polished. Right and left are sedilia or seats for the mourners, supported by columns of Devonshire marble. The roof is ribbed with stone-work. Shrubs are planted on the outside of the building, and iron rods fixed into pillars of Hanham stone, inclose the whole. These structures were designed, and have been carried out in all their details, by Mr. W. Smith, builder; the ironwork being done by Mr. S. Hobbs. Messrs. Palmer & Sheppard, of Bristol, executed the carving.

Leicester Cemetery. — A monument has been placed in the Church of England portion of this cemetery, to the memory of a young lady of the name of Jessop. It consists of a massive block of polished Peterhead Scotch granite, supporting a carved pedestal, shaft, and capital, in the hard grit stone from the Gaseby quarries, near Shipley, Yorkshire, terminating at an elevation of about 18 ft., with a sculptured statue of "Hope," in Sicilian marble, forming in the whole an attractive *ensemble*. The design is by Mr. Joseph Goddard, architect, of Leicester, and the work has been executed by Mr. John Barratt, also of Leicester.

BRICKMAKING BY MACHINERY.

Extensive works for the manufacture of bricks have just been completed by Major Stapylton, of Myton Hall, Helperby. The estate, under the management of Mr. Calder, is undergoing great improvement, especially in the erection of model farm-buildings and improved dwellings, requiring large quantities of bricks. To insure making more solid bricks than by hand, and doing away with skilled labour, he has introduced machinery driven by steam-power, which enables him to produce bricks with smooth surfaces like the "patent bricks." This is all done in one operation. After the clay is cast in the ordinary way it is put into wagons, and by means of a rope connected with the machine it is hauled up a tramway and tipped on to the rollers, which crush all foreign matter, such as stones, and thence enters the pug-mill, where it is thoroughly incorporated and made ready to enter the dies, from which it passes to the two cutting-tables, on each of which are cut at once six bricks. The average production of this machine is 20,000 per day. They are not, as with the ordinary hand-made bricks, put upon "the flats," but walled up at once as they come from the machine six or eight bricks high, thereby saving much expense in drying. Those bricks which are wanted for very particular purposes, such as facing, are passed through a special machine,—"the rotary press,"—which performs its work of pressing, and thereby consolidating the bricks. A brick is simply placed in front of the piston, which then forces it into the mould or die (of which there are four on a revolving shaft) of the desired size, and any superfluous clay is cut off, thus making all the bricks true and of uniform dimensions. During the return of the piston the box of dies or moulds revolves one-fourth of the way round, thus presenting another empty mould, which has already been oiled and cleaned by a self-acting lubricator, directly opposite the piston, to receive the next brick. In the meantime a self-acting push-plate forces the brick already pressed out of the die, upon a self-acting table, which carries them away, each brick being impressed with the initials of the proprietor.

Both of the machines described are driven by a horizontal engine, and are the productions of Mr. John Whitehead, of Preston, Lancashire, whose name is well known in connexion with brick-making plant.

FROM WALES.

Llanfechell Church, Anglesey.—This parish church, which is dedicated to St. Mechell, has been re-opened. The additions and alterations that have been made consist of a new north transept; the adaptation of the lower story of the tower as a robing-room; the removal of plaster ceiling, old pews, and other fittings; and replacing open sittings, modern pulpit, and prayer-desk; repairing and re-decorating the screen, which has now, with the wrought-iron cresting and central cross, a pleasing outline; the re-setting the font, which is of peculiar design, and is an object of interest to antiquaries; the introduction of standards, altar-rails, and other ironwork from the establishment of Messrs. Brown & Dowring, of Birmingham; the re-slating roof, re-coping gables, and the insertion of some new double-lighted windows of the same style as the lancet in the south side of the chancel. A stained-glass window, by Clutterbuck, of London, has been set up in the east window. It is the gift of Mr. W. B. Hughes, M.P., Plas Coch, as a memorial of his ancestors buried in Llanfechell Church.

Llanllechid National Schools.—These schools have lately been enlarged for the Ven. the Archdeacon of Merioneth.

A new church at *Llanfaglan*, near Carnarvon, is now in course of erection, in addition to the present parish church, which is remotely situated. The new church is intended to accommodate a large and more populous part of the parish.

The church at *Bodedern* is now in the course of restoration and enlargement. The Ven. Archdeacon of Bangor has used energetic efforts to procure funds for this purpose.

The parish church of *Llangwyfan* being severed from the main land by the encroachment of the sea, it has been found necessary to build another edifice in a distinct part of the parish, and by the liberality of Mr. O. A. Fuller Meyrick, of Bodorgan (who has gratuitously presented a site), and the rector and his curate, this is to be done. The architects in this and the preceding cases are Messrs. Kennedy & O'Donoghue.

CHURCH-BUILDING NEWS.

Sherington.—The parish church of Sherington, near Newport Pagnell, has been re-opened for public worship, after having undergone a restoration. The church is a cross church, the tower being in the centre of the building. It has north and south aisles. The old church had the high-backed pews, abundant whitewashing, and a platform at the west end, which marred the beauty of the west window. The whitewash has been removed, the high-backed pews have been replaced by chairs, the floor of the church presenting an open area, and the disfiguring of the platform has been removed. The church has a lofty, open roof. The chancel shows the most marked feature of restoration. It has a new open roof of oak, and has also been newly tiled. The reredos is of alabaster, inlaid with black marble, and is adorned by a cross of polished granite. The chancel floor is inlaid with Godwin's tiles, the choir stalls are of oak, there is a new iron altar-rail, and the chancel is divided from the nave by a pair of new wrought-iron gates, the work of Messrs. King & Sons, of Stoke Goldington. A recess has also been built for the organ, and adjoining it is the vestry. A painted east window represents in its three lights the circumstances surrounding the birth of Christ, His baptism by John, and His crucifixion. During the work of restoration the builders came upon a small single-light window looking upon the chancel. This has been restored, and a painted glass window placed there. Formerly the bells were rung from the ground-floor, so that the ringers inconveniently intervened between the nave and the chancel. This has been remedied by the erection of a new ringing-floor, so that the communication between the nave and the chancel is uninterrupted. The church is heated with hot air, the principle applied being in use in various churches in the neighbourhood. A memorial window, looking upon the south aisle, has been erected by Mrs. Umney, in memory of her late husband. The south porch has been restored, and a north doorway, disfigured by the mutilations of former years, has been discovered and restored. The restoration has not been carried as far as absolute necessity demands. The work has cost something like 1,000*l.*, mainly defrayed by the rector. The architect was Mr. G. E. Street; and the builders were Messrs. Shakeshaft & King, Newport Pagnell.

Manchester.—The new Church of St. James-the-Less, Newton-street, Great Ancoats, has been consecrated by the Bishop of Manchester. The building is of brick, constructed in the Early English style of architecture, with stone and coloured brick dressings, and coloured brick decorations in the interior. The church will seat 654 persons, and about 400 of the sittings will be free. The cost amounts to 2,500*l.*, all of which has been paid, except the sum of 300*l.*

Minsterworth.—The rebuilt parish church has been opened for divine service. It stands on the site of the old edifice, and is built of the grey stone of the neighbourhood, with Bath stone dressings. It has been erected upon a higher level, and has a tile-covered roof. The old tumble-down lath-and-plaster tower at the west end of the north aisle has been replaced by a new structure with a stone turret, and provided with six bells. On the south side of the nave is an oaken porch with open-timber work; and, seeing that the floods and high tides have made it needful to have the floors considerably above the churchyard level, all the entrances are approached by flights of steps. Instead of the two naves formerly existing, the church has now one nave and a lean-to aisle, separated by a new arcade, and an ample chancel and chancel-aisle or chantry. An arcade of three pillars separates the chancel from the chantry. The nave has an open-timbered ceiling. The chancel and sanctuary are paved with Minton's plain and encaustic tiles, and the aisles with Peake's; and there is Porrett's heating apparatus beneath the floors. The chancel arch is plain, and the corbels of the new pillar arcades are waiting to be

carved. An oaken screen divides the chancel from the nave, and when completed will be surmounted by a cross. The sanctuary rails are of plain oak. The doors are of sound oak, with ornamental hinges; there are new stalls in the chancel; and the old open seats in the nave, with their linen-pattern ends, have been simply repaired and restored. All the windows, save three, are of plain glass, with green-tinted border, and several of them are restorations from the old church. The large east window and the two smaller ones on the south side of the chancel are of painted glass, by Messrs. Clayton & Bell, and have been placed as memorials to the Hawkins family. In the east window the old tracery, with its Plantagenet lions, is preserved; and there are two sets of scenes in the three lights, each apparently representing events in the Saviour's life,—the Transfiguration, the Lord's Supper, the visit of the Wise Men, and so forth; and several Scriptural scenes are also graphically portrayed in the side windows. Mr. H. Woodyer was the architect. The contract was for 2,640*l.*, but did not include all items.

Ormskirk.—The foundation stone of Christ Church, Douglas, near Ormskirk, has been laid by Miss Morris, of Fairhurst Hall. The cost of the church will be over 5,000*l.*, and it will be built at the expense of Miss Morris, as a memorial of her mother. The site for the church and school is the gift of Sir Thomas George Fermor Hesketh, bart., M.P., of Rufford Hall. The plan of the church consists of a nave, 57 ft. by 28 ft., and 42 ft. high; north aisles separated from the nave by four pointed arches; chancel, 29 ft. by 20 ft.; organ-chamber and vestry on the north side of chancel; and a tower and spire, the lower portion of which is intended as a children's gallery. The tower is on the south side. Accommodation is provided for 409 adults. The whole of the benches and stalls will be of pitch pine. The inside will be lined with ashlar work, and the exterior will be built of Parbold stone, in courses and quarry face, and the dressings of Longridge stone. The tower and spire form a prominent feature on the plan, and will be about 115 ft. high. The architects are Messrs. Myres, Veevers, & Myres, of Preston; Mr. J. Pownall, of Preston, is clerk of the works; and Mr. John Preston, of Wigan, the builder.

Castle Hedingham.—The ancient parish church of Castle Hedingham has been re-opened after restorations. The lord of the manor and patron of the living, Mr. Lewis Majendie, has commenced the restoration by taking in hand the chancel, which he has restored at his own expense, and in accordance with the style of the period when it was erected,—late Norman. The work has been carried out by Mr. Z. Rogers, of Earls Colne, under the directions of the architect, Mr. Henry Woodyer, of Grafham. The roof has been restored,—it is high-pitched, with open rafters; the apex had been taken off and covered with a lead flat. The lancet windows in the walls have also been restored externally and internally, and fresh stonework inserted where necessary. The walls have been underpinned and refaced; all the old plaster being scraped off, and the stone flat buttresses and other work shown. On the north side an organ-chamber has been erected, opening into the north aisle by means of a screened arch and by a Norman arch, with its characteristic mouldings, into the chancel. The walls inside have all been re-plastered and the arcading restored, together with the chancel arch. A new corbel table runs under the eaves of the roofs outside. The carved fifteenth-century rood-screen, dividing the nave from the chancel, has also been restored, and gates added; a tall floriated cross, in the same crocketed style, being placed above in the centre. The ancient stalling, with curious and ludicrous carvings under the *misereres*, have also been restored, and additional stalls and "priests' seats" erected. The floor has been paved with Minton's tiles. A new floor has been laid in the vestry, the walls re-plastered, and the windows re-glazed. The three eastern lancets are filled with stained glass, manufactured by Messrs. Hardman & Co., Birmingham.

Acton Trussell.—St. James's Church, which has been closed nearly eight months, during its restoration by Mr. G. E. Street, has been re-opened for divine service. Two arches, one in the north wall, and another between the nave and tower, have been re-opened; as also a lychnoscope at the south-west end of the chancel. The screen between the nave and the new aisle is worked out of the sound portion of the old roof. The quaint-looking steeple, and parts of the north and south walls, have been rebuilt; a new roof has taken the place of the plastered ceiling, and the substitution of benches for pews, and the addition of a small aisle on the north-east side, give accommodation for 150 in the place of ninety-four. A small memorial window on the south-west side, by Clayton & Bell, has been given. The entire cost of the restoration is between 1,100*l.* and 1,200*l.* Mr. Espley, of Eccleshall, builder, has carried out the work.

Tansley.—The church of Tansley has been restored. Instructions were given to Messrs. Stevens & Robinson, of Derby, architects, to prepare plans for an extension of the north aisle, and for re-pewing the church. A contract was subsequently entered into with Messrs. Buxton & Son, of an adjoining parish, for the execution of the work; but within two months after the stone was laid both father and son died, and were buried in Tansley churchyard. A younger son, however, agreed to carry on the contract. The addition of one wing only to the church produces somewhat of an oddity; but it is intended to add a corresponding wing should further accommodation be required. These alterations will render necessary an enlargement of the chancel, which even now is too small. The whole of the ceiling has been replaced by new rafters, and the church is almost entirely repewed with open benches. The total cost of the alterations is 511*l.* 10*s.*

DISSENTING CHURCH BUILDING NEWS.

Doncaster.—The memorial stones of a new Wesleyan chapel and schools, in Oxford-place, have been laid. The new buildings are situated to the south of St. James-street, and occupy the rising part of the ground lately known as Crowther's-gardens. The front of the chapel faces the new street called Oxford-place, the schools being placed on either side, at a distance from the chapel of 46 ft., those to the right being for boys, and those on the left for girls and infants. The three front entrances of the chapel are reached by a broad flight of eight steps, terminating with a landing 3 ft. wide. The central doorway, leading to a central lobby, communicates to the body of the chapel right and left. The side doorways lead directly to the gallery staircase, and terminate on broad landings to each gallery. At the sides and rear of the chapel there are also provided three entrances, which will afford extra means for ingress or egress, as required. On the ground-floor, at the rear of the chapel, is a band-room, 33 ft. by 16 ft.; ministers' vestry, 16 ft. by 10 ft. 6 in.; two W.C.s, and lavatories. Also, from this part of the building, a staircase communicates to an upper floor, which contains two class-rooms, 15 ft. by 9 ft.; two, 16 ft. by 11 ft.; and one, 21 ft. by 12 ft. The outside dimensions of the building are 57 ft. 6 in. by 107 ft. The design is Italian, and the front and the return staircase wings executed in stone, the sides and rear being faced with white bricks. The chapel is divided into nave and aisles, the clearstory walls and nave roof being carried on cast-iron columns and wrought-iron box girders; the columns also support the side galleries. Under the galleries at each side are six semicircular-headed windows; a similar number are placed on each side for the galleries, and on the clearstory, on each side, are seven semicircular windows, 6 ft. diameter. The centre part of the front elevation rises to a height of 53 ft., this being the height of the nave roof; the wings, being lower, have a parapet, which continues round the sides, so that only a little of the aisle roofs will be seen. The roofs will be covered with the best Bangor slates. The interior ceilings of nave, aisles, and galleries will be divided into panels, and embellished with ornamental plaster-work. An organ-gallery is formed behind the pulpit or platform, and the opening is finished with an arch ornamented and moulded. The whole of the interior fittings will be of red deal, and wrought, stained, and varnished; the iron-work flatted and picked out in tints. The chapel will seat 1,000 persons. The school buildings on the left comprise girls' school, 54 ft. by 20 ft.; infants' school, 70 ft. by 20 ft.; and class-room, 15 ft. by 20 ft.; with lavatory and cloak-rooms. Those on the right are boys' school, 81 ft. by 20 ft., and a class-room, 16 ft. square, these also having entrance-lobby, lavatory, &c. Attached are large play-grounds and out-offices. These buildings are also of Classic character, and are faced with white bricks, red brick plinths, bands, strings, arches, cornices, and stone dressings. The interior woodwork of the roofs will be exposed to view, which, with all the other interior wood, will be wrought, stained, and varnished. The boundary walls will be coped and faced with stone, and surmounted with wrought-iron railings, having also two pairs of entrance carriage-gates, inclosing the front of the chapel in a semicircular form; also, running across right and left of the chapel to each school, will be walls and railings, entrance-gates for the schools, &c., but of more simple design. The contract for the whole has been undertaken by Mr. H. Arnold for 5,262*l.*, and is being rapidly pushed forward by him, under the supervision of Mr. W. Watson, of Wakefield, the architect.

Fenton.—A Methodist New Connexion new chapel has been opened here for public worship. The new edifice occupies the site of the old chapel, with the addition of ground at the rear, from which some old buildngs have been removed. It is in the Gothic style of architecture, according to examples in France and Germany in the thirteenth and fourteenth centuries. The total length, exclusive of the entrance, is 55 ft. 6 in.; the width, 40 ft. 3 in.; the height from ground line to ridge, 51 ft. The front gable, facing Market-street, contains the principal entrance, and has three wide doorways with moulded arches, and stone labels with carved terminals, supported by circular stone shafts, with circular moulded bases, bands, and carved caps, the whole surmounted by a large five-light stone window with tracery in the head. To the right and left of the entrance are staircases leading to the galleries and orchestra, the right staircase being surmounted with a tall, slated, spirelet roof, and the left staircase surmounted by a tower with buttressed angles and spire, the total height of which is 110 ft. to the top of the metal finial with which it is to be crowned. There is a gallery around two sides and one end, with a circular enriched and moulded front. The school, which is at the further end of the chapel, is two stories high, entrances to which are from Park-street. The total length is 56 ft. 6 in., and the width 35 ft. 6 in. The rooms are divided into departments for boys and girls, with separate entrances, in which are a number of class-rooms. Portable partitions are fixed in the upper room, so as to be readily taken down in order to admit of the room being used as a lecture-hall, or for public meetings. The chapel will accommodate about 700, and the schools are sufficiently large for nearly that number of children. The total cost, including the purchase of old buildings to enlarge the site, has reached nearly 4,000*l.*, of which sum there have been about 2,000*l.* raised. The architect is Mr. Pinchbeck; and the contractors are Messrs. Wade, Brothers, all of Manchester. The interior, although sufficiently advanced to admit of the opening service, is not quite completed. The exterior is not quite finished either.

Stockport.—The foundation-stone of a new Wesleyan Chapel has been laid at the Moore. The building is to have a school attached, and the cost will be 1,000*l.* The size of the chapel will be 38 ft. by 23 ft.; the school, 29 ft. by 16 ft. The latter, being only separated by folding doors, can be opened to the chapel during divine service. The frontage will be 81 ft. in length. The rear will extend to the embankment of the London and North-Western Railway. Accommodation for seating 160 persons will be provided. The architects are Messrs. Pierpoint, Hughes, & Pierpoint, of Warrington. The style will be Gothic.

Lincoln.—The memorial corner-stones of the new chapel for the Baptist congregation worshipping in Mint-lane have been laid. The building now being erected by Messrs. Barnes & Wright, builders, from the designs of Messrs. Drury & Mortimer, architects, is situate upon the old site in Mint-lane, and has a superficial area of 2,040 ft., with 600 sittings. The old chapel was 1,600 ft. in area, with 360 sittings. The additional sittings have been gained by making every spare inch of the ground available, and to this end the front of the building is close to the foot pavement, and arranged without any breaks. The front is designed in the modern development of the Romanesque style, and is arranged in three stages—the lower, containing the two entrance doorways and the triplet window, lighting the centre body of the chapel; the second stage is occupied by a window lighting the gallery floor; and the upper stage consists of an arched opening, combined with an arcaded coping to the gable. A slight depression of the north side roof gives more distinction to the centre composition, and a tower, with angle turrets and

low slated spire—total height, about 70 ft. at the south angle—marks the purpose of the building. The interior is proposed to be fitted with open seats. The pulpit will accommodate several ministers. The baptistery, which is placed in front of the pulpit, will be lined with white glazed tiles. The entrance passages on the ground-floor will be paved with Maw & Co.'s geometrical ornamental tiles. The building will be heated by hot water, and lighted with star burners suspended from the roof. Attention has been given to insure ventilation. The building is to be covered in with an open timber roof, and a sufficiency of light is secured by the aid of a long range of clearstory windows on each side of the roof. There will be large windows towards the south, overlooking the garden premises of Messrs. Smith & Ellison's bank. These windows, together with three others on the north side, will insure abundant light, which, for the present, is to be subdued by the adoption of cathedral tinted glass, with the intention, ere long, when funds may permit, of replacing it with stained glass. The probable total cost of the edifice will be about 1,400*l.*, exclusive of the value of the old materials.]

Ripon.—The foundation-stone of a Congregational church has been laid here. Mr. J. P. Pritchett, of Darlington, is the architect. The contractors for the church are the following:—Messrs. Wright & Son, Thirsk, masons and plasterers; Messrs. M'Adam & Co., joiners and iron-founders, Alston; Mr. G. W. Wilson, plumber, Leeds; Mr. Briggs, painter, Lowmoor. Mr. W. Dougill, of Ripley, is clerk of the works. The cost of the church, including fencing and out-buildings, will be about 3,000*l.* There will be a tower and spire at the south-west corner 100 ft. high. The gable end next the main road will contain a door under a projecting gable in the floor level, with a four-light window over it rising into the main gable, which is surmounted by a floriated cross or finial. The tower at one corner is in four stages, brushing a somewhat narrower door in the lower stage, a two-light window in the second stage, and belfry-windows in the upper stage; the whole surmounted by a spire, finished by a vane. A staircase will occupy the opposite corner, having a similar door in the lower stage, and a rose-window above, the roo being hipped to the octagonal shape of the staircase. The side of the church faces the new road, which the trustees of the ground are making. The side is relieved by the transept gable end, which has two windows on the ground, and a rose window above. The rest of the side is divided into four bays, the corner one being occupied by the tower and spire, the others having long two-light windows between buttresses. The choir is somewhat lower than the nave, and has a rose-window in the gable. Behind the church is the school, with the gable end to the side road. At the east side of the church is the minister's house, which is simple, but characteristic in design. It has a bay-window of two stories in the front; and the house being irregular in plan, the hipped roofs break up the outline. Internally, the church is divided into nave and aisles by light iron pillars supporting a narrower gallery running round three sides of the church; and these pillars rise above the gallery, to support wooden arches, from which rises the roof, which is wagon-headed, divided into panels by carved braces and moulded purlines. The choir arch is of moulded stone, with marble pillars, carved capitals, and moulded bases. The seats, which provide accommodation for about 600 adults, are to be all open stalls, with slanting backs, all of pine, varnished. The windows will be glazed with cathedral-tinted glass, and the passages paved with mosaic tiles. The school is designed to have a simple open roof, and will accommodate about 300 children. The whole of the site is to be surrounded by an ornamental railing on a low wall.

Books Received.

Report to the Tottenham Local Board of Health on the Disposal of the Sewage of their District. May, 1870. London: Spon.

This Committee report enters at some length into the details of various systems of treating sewage, by deodorisation, irrigation, &c., as practised in different parts of the country; and the reporters come to the conclusion that irrigation, upon the whole, is decidedly the best. The report is signed Edward Clarke and James Brickwell, two of the members of the Sewage Committee, and P. P. Marshall, C.E., surveyor to the Board. A dissentient report is appended, signed William Hall, Member of the Committee, who advocates precipitation and filtration with deodorisation "by the best means known." The dissentient member, however, according to the committee's report, agrees with them so far "that irrigation is on the whole the best method of dealing with the sewage," although he "would recommend precipitation and filtration for Tottenham." The committee recommend that some of the marsh-land in the parish should be selected as a sewage farm for the greater part of the sewage, in the disposal of which, in any way, pumping will be requisite; and, for the remainder, they find that land is obtainable at a reasonable price in a favourable position for irrigation.

Patronymica Cornu-Britannica; or, the Etymology of Cornish Surnames. By Richard Stephen Charnock, Ph. Dr., &c. London: Longmans & Co.

Now that the Cornish dialect of the Keltic language is literally extinct as a spoken tongue, a list of Cornish proper names, with their etymology and meaning, is both curious and valuable. The present collection is made from various quarters, including the Post-office Directory for Cornwall; from private lists, and from the works of Pryce and Polwhele. The volume contains from 1,200 to 1,400 surnames. Many of the Cornish surnames, however, are more or less identical with the Welsh, but there are many Cornish and few Welsh in existence.

VARIORUM.

"*Les Promenades de Paris: Bois de Boulogne, &c.* Par A. Alphand and G. Davioud." We have already spoken of the earlier parts of this superb work. Since then, many more have been issued, and we shall take an opportunity to speak of them fully. The publisher is at this moment in London (11, Portland-terrace, St. John's Wood), and we go out of our way, in view of the present exceptional and distressing position of Paris, to mention this circumstance, in case any of our readers should feel inclined to examine the work for themselves.—— The current number of the *Art Journal* includes an engraving after W. Hemsley's "Left in Charge." Wilton House is the subject treated of by the editor under his heading, "The Stately Homes of England."——A photograph of a Portrait by Vandyck, name unknown, in the new number of *Art Pictorial and Industrial*, is itself worth the cost of the number.—— *London Society*, from its new quarters (Burlington-street) keeps its old aspect. —— From *Cassell's Household Guide* we quote a few lines anent "The House:" — "The rapidly-increasing value of land in every district easy of approach by rail has brought about a degree of discomfort in domestic architecture undreamt of in former times. Good housewives, accustomed to roomy stair-landings, long passages, large cupboards, and separate offices for various kinds of household labour, reconcile themselves with difficulty to the circumscribed dimensions usually afforded for domestic purposes in modern villa residences. Nor is the complaint confined to the immediate neighbourhood of large towns. Even remote rural districts are becoming a prey to the novel system of house-building and its attendant inconveniences. One of the first acts of denial imposed upon most housewives, in order to meet existing circumstances, consists in giving up the keeping of any kind of stores. The nearest grocer's shop has become in most establishments the substitute for the storeroom; and a poor substitute, at the best of times, that warehouse proves, entailing endless vexations and disappointments, which were unknown when it was the custom for all well-to-do families to provide for their daily wants in advance. Fitted with every requisite to meet the numberless emergencies that arise in domestic life, the compact little apartment was at once the general resort in moments of need, and a pleasing and healthful source of occupation to the female members of a household. Intent upon laying in stores, at convenient seasons, in preserving, pickling, herb-drying, sauce-making, sorting and arranging goods, much time was profitably employed, which now hangs heavily on the hands of many women. If with the cessation of the above duties a corresponding amount of gain were secured, regrets on the subject need be but few. It is not so, however." —— The *Quarterly Journal of Science* for October has much good matter on the Surveys of India, the Eclipse of August 7th, and other subjects.——Hardwicke's *Science Gossip* continues its pleasant way amongst flowers and rocks, spotted with birds and insects. The number for October is quite equal to those that have preceded it.——*The Arena* is the title of a new illustrated monthly magazine (75, Great Queen-street), which seems to desire to open a way for new and hitherto untried men. Some promising stories are commenced in it.——Messrs. Longman have issued "A Graduated Course of Elementary Problems in practical Plane Geometry. By John Lowres, Science Teacher." It is designed chiefly for the use of students in science classes in connexion with the Science and Art Department.

Miscellanea.

The Fall of the House in Glasgow: Cause of the Occurrence.—Mr. James Lamb, Inspector of Buildings, and Mr. Robert Taylor, builder, the skilled person to whom the Sheriff made a remit to inspect Messrs. Law's buildings at Belmont-crescent, which fell, have made a report describing what, in their opinion, caused the accident. In substance the conclusions to which they have arrived are as follow:—That the occurrence resulted partly from too hurried construction, not permitting time for the consolidation of the lime and stone in the building, partly from the joisting lying wholly in one direction, instead of alternate cross tiers, which would have given a certain support to the walls that fell; but chiefly from the stones being of inferior quality, badly dressed, and carelessly put together, without a sufficient proportion of headers or band stones. The reporters further consider that the mortar was wanting in a sufficient proportion of lime, and was consequently deficient in cohesive power; that the packing of the walls between the exterior and interior facing stones was of bad quality, being mere shivers; and that, generally, the mortar, such as it was, was too sparingly used. It appears that nothing was discovered in the foundation to account for the fall of the building.

Mortuary Buildings for City of London.—At the last meeting of the Commissioners of Sewers, a report of the Sanitary Committee with reference to the erection of mortuary buildings for the City, was considered. The chairman stated that some time ago the Court authorised the committee to spend 13,000*l.* in the purchase of a site, and the erection thereon of a mortuary. A site had been purchased for 5,000*l.*, and 8,000*l.* remained for the buildings. Since then another piece of land adjoining the site had been offered to them for 750*l.*, and the question was whether they should purchase it. Mr. Haywood's estimate for the buildings was 9,400*l.*, so that, including the additional piece of ground, the total cost would be 15,000*l.*, being an increase of 2,000*l.* upon the amount authorised to be spent,—namely, 13,000*l.* Some discussion took place upon the subject, in the course of which it was stated that one of the metropolitan parishes had provided a mortuary for 1,000*l.*, and an opinion was expressed that 15,000*l.*, or even 13,000*l.*, was too large a sum to be spent on a mortuary for the City, in which there would be only a few bodies. Eventually a vote was taken adverse to purchasing the additional piece of land, and the whole subject was referred back to the committee for further consideration.

The New Town Clock, Hoddesdon.—This clock was manufactured by Messrs. Gillett & Bland, of Croydon (who were also the makers of the great clock for the International Exhibition of 1862, exhibited by Benson, and of the Gog and Magog clock at Bennett's, in Cheapside). It goes eight days, and strikes the hours upon the old bell, and the quarters upon the two new bells, and shows the time upon three dials, each 4 ft. in diameter, one of which, facing the High-street, is illuminated upon an improved principle by gas; the other two dials are copper, with gilt figures and minutes. Amongst the many improvements introduced in the clock is the gravity escapement, the invention of Mr. E. B. Denison, Q.C.; and instead of the ordinary wood rod pendulum, which is subject to considerable variations, it has a compensated zinc and iron pendulum. There is an engraved and silvered dial on the clock, for the purpose of regulating the outer hands from the inside.

War Appliances.—Advices from Paris, by balloon mail, announce that an immense iron reservoir, supported upon bricks, has been placed in front of the Gallery of Apollo in the Louvre, and will be kept filled from the Seine by two steam pumps, as a precautionary measure in case of the Louvre or Tuileries taking fire. The Paris Government have taken possession of all the carriages of the Chemin de Fer du Nord for special ambulance service upon the ramparts. ——The present war is likely to give a great impulse to man's rule over the air. Experiments are being made with balloons by the Government authorities at Woolwich. They find that captive balloons can be fitted with telegraph wires, and messages sent to head-quarters instantaneously, pointing out the progress of an action as regards the state and procedure of both armies. Panoramic photographs of a whole field of war, whether previous to, during, or after the battle, can be taken and studied at leisure. War balloons in store will, no doubt, be a new item in war supplies.——A French paper says that the difference of gauge between the French and German railways has proved a hinderance to the Germans in using their own engines and carriages on the former. The bridges and viaducts in France are so low that it has been necessary to shorten the chimneys of the German locomotives very considerably, and this takes up a good deal of time.

Foundation-stone of Old Blackfriars Bridge. — The foundation-stone of old Blackfriars Bridge was last week discovered. Beneath the stone was found a guinea, a half-guinea, a crown, a half-crown, a shilling, two sixpences, 31 halfpence, and a farthing, and upon it was the following inscription :—

"On the last day of October, in the year 1760,
and in the beginning of the most auspicious reign
of George the 3d,
Sir Thomas Chitty, Knight, Lord Mayor,
Layd the first stone of this Bridge,
undertaken by the Common Council of London
in the height of an extensive War,
for the Public accommodation
and ornament of the City,
Robert Mylne being the Architect,
and that there may remain to posterity
a monument of the City's affection for the man
who, by the strength of his genius,
the steadiness of his mind,
and a kind of happy contagion of his probity and spirit,
under the Divine favour
and fortunate auspices of George the Second,
recovered, augmented, and secured
the British Empire
in Asia, Africa, and America,
and restored the antient reputation
and influence of his Country
amongst the Nations of Europe,
the Citizens of London have unanimously voted
this Bridge to be inscribed with the name of
William Pitt."

"Colours and Dyes in Early Times."—Commenting on the article on this subject, reprinted from our pages, the editor of the *Mayo Constitution* says,—"Through the length and breadth of our island the traveller will not light on any portion of it more pregnant of associations of old times than West Connaught. This is particularly the case with regard to the subject matter of the above paper. The Claddagh cloak of every description is very remarkable. The other day, a Galway tradesman had the distinguished honour of receiving an order for one each (crimson pattern) for her Royal Highness the Princess of Wales, Princess Beatrice, and Princess Christian. That there was no indigenous plant in this country to dye blue in Dr. Nicholson's day (1725) can only be true so far as the extent of his inquiry went, for the blue dye has been known to the peasantry of Mayo for generations.* The colour predominates in Partry. If a peasant is seen wearing a pair of blue stockings, he is at once put down as a Partryman. In the parish of Turlough, near Castlebar, there is an excellent blue frieze made, containing a very small admixture of white. The purple dye is peculiar to the clothing of the people of the baronies of Tyrawly and Costello. Before the famine, a comfortable-looking dark brown dress was worn by the country girls. Now-a-days they wear muslins and light frippery, to be *à la mode* if they can.

The Hulme Town-hall.—The interior of this building has just been decorated by Messrs. Edmondson & Pollitt, of Bridge-street, Manchester, at a cost of nearly 600*l.* The walls of the hall have been painted a dark colour, and the ornamental parts gilded and figured. The ceiling has been painted in several striking colours. The large refreshment-room and the committee-room have also been decorated.

* Exactly what we stated.

Proposed New Naval College.—Admiral Kelly, who died about three years ago, left by his will a sum of money, supposed now to amount to upwards of 100,000*l.*, to found a college in Devonshire for the primary education of naval officers' sons. The will has been the subject of litigation, but arrangements have just been come to by which all further opposition ceased, and it is stated to be almost certain that the college trustees will accept the offer of the Duke of Bedford to give a fine site for a college at Tavistock, and 5,000*l.* towards the cost of its erection. It is also said that the Tavistock Grammar School will be merged into the new college. The matter has excited great interest and competition among various towns in South-West Devon.

Re-opening of Gingerbread Hall Bridge. This new bridge at Great Baddow, which has been erected by the Chelmsford Highway Board, has been opened for traffic. It is 17 ft. wide between the iron railings, or 6 ft. wider than the old tumble-down structure which it has superseded. It is built of brick and iron, the work having been carried out under the superintendence of Mr. Whitmore, the surveyor to the Board, by the following contractors :—For brickwork, Mr. James Patten, Great Baddow; ironwork, Messrs. Coleman & Morton, Chelmsford; stonework, Mr. Wray, Springfield.

Keeping Bronze Statues Clean.—It was observed in Berlin that those parts of a bronze statue which were much handled by the public retained a good surface, and this led to the conclusion that fat had something to do with it. An experiment was therefore tried for some years with four bronzes: one, says our authority, *Chambers's Journal*, was coated every day with oil, and wiped with a cloth; another was washed every day with water; the third was similarly washed, but was oiled twice a year; and the fourth was left untouched. The first looked beautiful; the third, which had been oiled twice a year, was passable; the second looked dead; and the fourth was dull and black. Perhaps public authorities in this country who have charge of statues and other adornments will profit by the experiment here described.

Laying the Top Stone of Chester Cathedral Tower.—The top stone of Chester Cathedral Tower has been laid, as marking an important stage in the completion of the restorations. The stone was laid by a little girl, the daughter of Dean Howson, in presence of some American and other friends. Before the party descended from the tower, which was not done until Dr. Howson's young daughter had been lifted to a seat on the top of the pinnacle, the Dean expressed a hope that arrangements would soon be made, in co-operation with Mr. Thompson, the contractor, for some celebration of the event by all the workmen under his superintendence. This will probably take place when the external roof of the nave has been completed.

New Masonic Hall in Bristol.—It is said that the erection of the new Masonic Hall, to be built in Park-row, on a portion of the Tyndall estate, exactly opposite Park-street avenue, will be very shortly commenced. The entire plan, according to the local *Times*, embraces a banqueting-hall, with its necessary appendages, including kitchens, and will cost 5,000*l.*; but the promoters will at first only proceed with the portion necessary for the meetings of the several lodges, the cost of which will be between 3,000*l.* and 4,000*l.* The structure is to be worthy of the city.

"Stanmore, Salop."—We would add to the account of this residence, given in the *Builder* of last week, that all the painting and coloured decorations were executed by Messrs. J. G. Crace & Son, of London. It is desirable, also, we should point out that a doorway to the dining-room from the hall is accidentally omitted to be shown on plan.

Straightening a Chimney. — It is stated that the furnace-chimney at the Goole Alum Company's works having subsided to the extent of 4 ft. out of perpendicular, was thus set right :—A layer of bricks, about two-thirds of the way round, and about 20 ft. from the base, was cut out. When this layer of bricks had been taken out, strong iron wedges were introduced, and a thin layer of brick put in the place of the course of bricks extracted. When this had been accomplished, the wedges were then drawn out, and the stupendous structure came over on to the new-made bed, assuming its original position. This was a dangerous process, and needed clear heads.

TENDERS.

For finishing two pairs of villas in Hornsey-lane. Mr. J. W. Reed, architect :—

Williams & Son	£3,487 0 0
Sale	2,842 0 0
Winship	2,795 0 0
Hawkes	2,665 0 0

For alterations and additions to stables at Tewkesbury Lodge, Forest-hill. Messrs. Tress & Innes, architects. Quantities supplied :—

Colls & Son	£695 0 0
Coleman	690 0 0
Thompson	680 0 0
Fish	660 0 0
King & Son	656 0 0
Burchell	651 0 0
Waterson	645 0 0
Heards	634 0 0
Jerrard	619 0 0
Mitchell	550 0 0

For the erection of a new tun-room for Messrs. Taylor, Walker, & Co., Limehouse. Mr. Charles Dunch, architect. Quantities supplied :—

Macey	£1,329 0 0
Conder	1,295 0 0
Johnstone	1,279 0 0
Palmer	1,250 0 0
Ennor	1,244 0 0
Newman & Mann	1,136 0 0
Kilby	1,130 0 0
Hill, Keddell, & Waldram*	1,058 0 0

* Accepted.

For the erection of schools, Bermondsey. Mr. Joseph Gale, architect :—

Colls	£4,678 0 0
Ashby & Sons	4,450 0 0
Sewell & Son	4,365 0 0
King & Son	4,365 0 0
Henshaw	4,363 0 0
Sheppard	4,275 0 0
Browne & Robinson	4,251 0 0

For new sewers, Catford Bridge, Anerley and Forest-hill, for the Lewisham Board of Works :—

Coker	£364 17 0!
Crockett	862 0 0
Pearson	742 0 0
Bellamy	703 0 0
Cole	691 17 0
Hayward	677 0 0
Woolnough	653 0 0
Blackwood	587 0 0
Pizzey	569 0 0
Harris	535 0 0
Young	522 0 0
Carter (accepted)	520 0 0
Hubbard	486 0 0
Haynes	347 2 0!

For new infirmary for St. Mary Abbot's, Kensington. Mr. A. Williams and Mr. H. Saxon Snell, architects. Quantities by Messrs. Lansdown & Pollard and Messrs. Mann & Saunders. Net amounts after deducting the value of the old buildings on site :—

J. & A. Wright	£41,060 0 0
Hockley	39,780 0 0
Cowland	38,980 0 0
Scrivener & White	37,943 0 0
Lacey	37,690 0 0
Crockett	37,495 0 0
J. & S. Williams	37,000 0 0
Capps & Ritso	36,600 0 0
Crabb & Vaughan	36,525 0 0
Higgs	36,273 0 0
Blackmore & Morley	36,191 0 0
Manley & Rogers	35,666 0 0
Markwick & Thurgood	35,153 0 0
Wigmore	34,585 0 0
J. & A. Wilson	34,550 0 0
Henshaw	33,457 0 0
Hill, Keddell, & Waldram	33,270 0 0
Chappell (accepted)	33,233 0 0

For new sewers for the parish of Lambeth. Mr. Hugh McIntosh, surveyor :—

Crockett	£13,500 0 0
Dickinson & Oliver	12,290 0 0
Brown	11,966 0 0
Jackson	11,900 0 0
Morriss	10,600 0 0
Blackmore	10,073 0 0
Pearson	9,710 0 0
Hubbard	9,700 0 0
Goodair	9,350 0 0
Wigmore	8,999 10 0
Ritzon	8,900 0 0
Mayo (accepted)	8,499 0 0
Carter	7,895 0 0

For the erection of granary and flour-mills, Waterloo Wharf, Lambeth, for Mr. Seth Taylor. Mr. George J. Loe, architect :—

Brass	£11,720 0 0
Lawrence	11,332 0 0
Holland & Hannen	9,766 0 0
Woodward	9,685 0 0
Perry	9,654 0 0
Hill, Keddell, & Waldram	9,386 0 0
Conder	9,300 0 0
Hart	8,840 0 0
Crabb & Vaughan (accepted)	8,690 0 0

For proposed new factory and dwelling-house in Farringdon-road, for Mr. F. G. Lloyd. Mr. F. A. Gruning, architect. Quantities supplied by Messrs. Gardner & Bell :—

Kipps	£8,959 0 0
Dickinson & Oliver	8,500 0 0
Holland & Hannen	8,265 0 0
Trollope	8,243 0 0
Mansfield, Price, & Co.	8,175 0 0
Henshaw	7,957 0 0
Newman & Mann	7,856 0 0
Hill, Keddell, & Waldram*	7,595 0 0

* Accepted.

For repairs to Nelson Inn, Nelson-street, Woolwich, for Messrs. H. & V. Nicholl. Mr. E. H. Badger, architect. Quantities not supplied:—

Payne & Balding	£650	0	0
Penny	556	0	0
Jerrard	549	0	0
Bush	547	0	0

For house and stabling at Lordship-lane, Dulwich, for Mr. W. Hewett. Mr. T. R. Smith, architect. Quantities not supplied:—

	House.			Stable.		
Roberts	£1,339	0	0	£195	0	0
Burchell	1,315	0	0	199	0	0
Ashwell	1,258	0	0	189	0	0
Jerrard	1,278	0	0	165	0	0

For new carriage-shed at Bow, for the North London Railway Company:—

Brutey	£13,550	0	0
Marion	12,727	0	0
Saul	10,800	0	0
Perry & Co.	10,700	0	0
Crockett	10,200	0	0
Mann	10,093	0	0
Wall	9,990	0	0
Henshaw	9,983	0	0
Blackmore & Morley	9,805	0	0
Mansfield, Price, & Co.	9,800	0	0
Blease	9,779	0	0
Snowball	9,470	0	0
Abrahams	9,414	0	0
Hill, Keddell, & Waldram	9,410	0	0
Cardus	9,090	0	0
Wicks, Bangs, & Co.	8,950	0	0
Myers & Sons	8,730	0	0
Watts	8,253	0	0

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(Signed) J. M. Drago,
Treasurer of the National Government.
Jose Tomas Rojo.
Juan M. Alvarez.

A true Copy.—A. M. Bell."

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PART I.	Maximum of Marks.
Mathematics, including Geometry, Trigonometry, Algebra, Differential and Integral Calculus, and Geometrical Optics	100
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No Candidate will be eligible who does not show some proficiency under one at least of the heads included in Part I.

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	1,000

*** Each of the groups lettered A, B, C, D, to include designs, estimates, specifications, and the mechanical contrivances connected with it; and candidates will be required to show that they have been engaged in the practice of their profession on adequate works for a sufficient time, or have had in some other way satisfactory opportunities of becoming acquainted with the practice of their profession in some one of the branches thus indicated. Persons wishing to compete should forward, not later than OCTOBER 31st, evidence of their age (which must be between 26 and 40) and professional training, to "The Secretary, Civil Service Commission, Cannon-row, London, S.W." Such further inquiries as may be necessary will be made by the Civil service Commissioners with regard to the age of candidates, and also as to their health and character.
Dublin Castle, 4th October, 1870.

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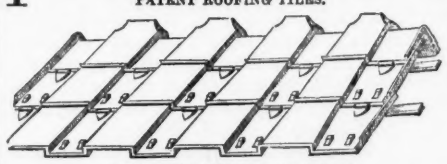

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